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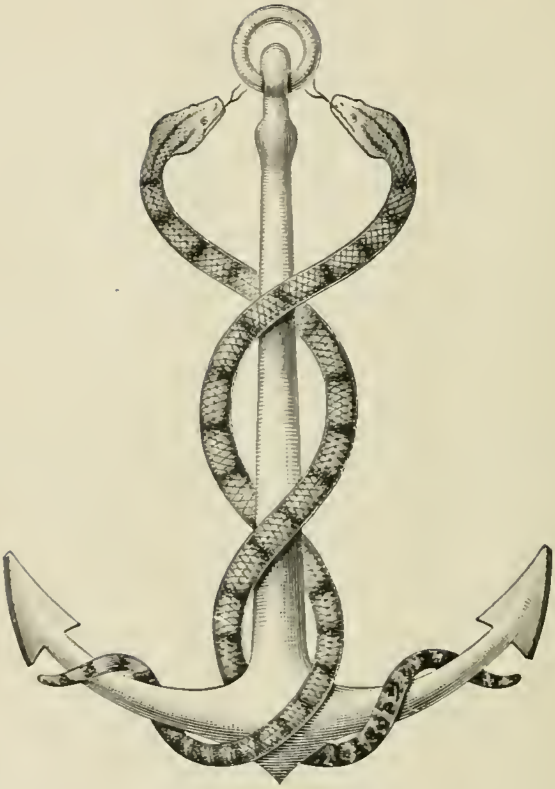

NUNQUAM ALIUD NATURA, ALIUD SAPIENTIA DICIT.

THE EDINBURGH MEDICAL JOURNAL

EDITED BY

ALEXIS THOMSON, M.D., F.R.C.S.Ed.

AND

HARVEY LITTLEJOHN, M.B., F.R.C.S.Ed.

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THE
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EDITORIAL.

The Apotheosis of the Layman.

One of the most remarkable anachronisms of our contemporary life is that, concomitant with the increased power of the specialist, comes the triumph of the layman. Every branch of the social economy is shadowed by him; and although to the critical eye there is no fear of deception, yet it is often difficult for the untrained observer to know where the skilled workman ends and where the capable amateur begins. With the "rough reader"—to use Mr. Birrell's apt phrase—there is no attempt to distinguish between the two, until both fact and expression become chaotic, and man has either many masters or none. There need not be much fear as far as Time is concerned, but inasmuch as the moment is in evidence, with its deafening thundering of multitudinous voices—to use Carlylean phraseology—there seems to be a very pageantry of the blind leading the blind, and from the bottom of the pit into which they have fallen there come voices which claim an equal hearing with those which reach to the stars. The general expression of modern life and literature is the very apotheosis of the amateur, despite the fact that at no time have the few aimed at a higher standard of cultivated and matured interpretation of imagination and experience. And the only apology that can be put forward on behalf of the lay dilettante is that he makes no hypocritical attempt to disguise his want of qualifications. He is pretentious, he is sadly lacking in a sense of humour, but he is not a quack. The public may vaunt him as an intellectual Crœsus, as a scientific Demosthenes, but that is not his fault, it is only his fortune. The ingenuous outlook of the layman, with its frank admission of ignorance, could not be better exemplified than in the Preface to Mr. Carnegie's "Life of James Watt": "Why shouldn't I write the life of the maker of the steam-engine?" he says. "I knew little of the history of the steam-engine, and of Watt himself, and the surest way to obtain knowledge was to comply with the publishers' highly complimentary request." Bravo! That is delicious. What a prospect it opens for the imaginative amateur!

May we look for a Life of Charles Darwin by Mr. Lloyd George, and a Memoir of Voltaire by Mr. Pierpoint Morgan? The series might be designated, "The Unconscious Humorists, or Poachers on Parnassus." The method of culture here suggested by Mr. Carnegie is neither new nor startling. It lies at the very basis of the method of the layman. He reads a book and longs to write about it; he hears a song and echoes it in provincial parlours; he sees a picture and spends a hard-earned half-crown on a box of paints. We forgave Mrs. Humphry Ward for her belated dabbling in Biblical Criticism when she wrote "Robert Elsmere," because she was a woman of letters, though that in itself was a lame excuse for turning her artistry to quasi-philosophic material. We did not forgive Professor Henry Drummond for attempting to draw the scientific longbow in "Natural Law in the Spiritual World"; but the public will readily forgive Mr. Carnegie, because, being a patron of libraries, has he not the right also to be a patron of letters? But this instance of the millionaire seeking education at the expense of literary capacity and taste, is but a text on which to elaborate a discourse for which endless instances might be culled from modern life. The press is loaded with the opinions of sportsmen on art, philanthropists on science, and actors on political economy. A newspaper lies before us at this moment in which Mdlle. Yvette Guilbert's opinion on international politics is gravely quoted for the delectation of the public. It matters not if the expression of her views is loaded with platitude and solecism, if it utterly fails to touch the essential issues at stake. That is a secondary consideration. Mdlle. Guilbert is a figure to be counted upon in the perspective of our modern life. She sings French *chansons* inimitably. She is a power in the land. She must, therefore, have a free pass into the forum of public discussion, and the daily papers must give her grandiloquent headlines to herald her opinions on questions altogether foreign to her knowledge or her sense of humour. And so the feast goes on, and the satirist keeps dumb. Mænad-like, the public winds flowers in its hair, and goes from bad to worse. It crams its columns indiscriminately with ignorant effusions on the "Simple Life" from the pens of counterjumpers and curates, who, pampered by the attentions of a casual and uncritical public, venture to the very halls of science itself, and call out for the heads of the learned. After all, there is something very funny in this, but it is only the man who knows who sees the joke. What a glorious time George Meredith's Spirit of Comedy must be having!

Anæsthetics and Dentistry.

In a circular issued by the Crown Office, and sent to the two Medical Corporations in Scotland which grant dental diplomas, attention is drawn to the risks attending the administration by dentists of certain anæsthetics, such as ethyl chloride, for the purpose of producing short periods of anæsthesia, without precautions being taken previously to ascertain the physical fitness of the patient to stand the anæsthetic.

If we may venture a surmise, this document owes its genesis to the fact that thirty-two recorded deaths are attributed to the anæsthetic named above, and to the apprehension aroused at the Crown Office lest the lives of the lieges should be imperilled by the indiscriminate administration by unskilled persons of a lethal drug. If, as the result of this letter, the inexperienced and uninstructed are induced to refrain from using anæsthetics with whose properties they are unfamiliar, and whose dangers they know neither how to avert nor how to deal with when they arise, a most beneficent purpose will have been served. The administration of a general anæsthetic is, indeed, a procedure which the Crown and the public have a right to demand should be hedged about with safeguards. It might reasonably enough be expected that the medical curriculum should always include adequate instruction by specially skilled and experienced teachers in the use of general anæsthetics, and that every candidate for a qualification should be required to show his knowledge of and competency in their employment. The universities and medical schools in Scotland do not, so far as we are aware, provide these safeguards, and the tale of anæsthetic fatalities mounts apace. As for ethyl chloride, considering that it has been so largely given by those whose only knowledge of it is derived from the printed page or even the manufacturers' circular, in doses far too large, for periods far too long, in quite unsuitable apparatus, the wonder is, not that there have been so many deaths, but so few.

The letter gives rise to other reflections. We may ask, though we may wait indefinitely for a reply: What is the exact position of a dentist in regard to the administration of anæsthetics? Is the right to give them vested in him by virtue of his diploma; or does he defy the law every time he gives gas; or is there any law to defy?

In England quacks have been charged with manslaughter after patients have died on their hands, but judges' charges and juries' verdicts have generally been favourable to the quacks; in Scotland a "wigging" from the Fiscal might be the outcome; in neither country, so far as we know, have criminal proceedings been taken against a duly qualified dentist for losing a patient under an anæsthetic. Use and wont in such matters is always taken into account, and it seems at any rate probable that use and wont would be held to justify a dentist in the administration of what are called "single dose" anæsthetics, such as gas, or the mixtures of gas and ether, or gas and ethyl chloride; and it may further be assumed that, failing a proof of gross carelessness, no criminal charge would lie against a dentist unfortunate enough to lose a patient under one of these.

It will be noticed that the letter of the Crown Agent says no word of prohibition; it only asks that the dentist should satisfy himself, before administering any general anæsthetic, as to the patient's physical fitness, either by obtaining himself, or through the patient, a medical opinion to that effect. The Royal College of Surgeons invites the attention of its dental diplomates to a former recommendation of Crown Counsel, that a duly qualified medical man should be present at the administration of anæsthetics. This recommendation is followed in the case of patients who can afford to pay the doctor's and the dentist's fees; in the great majority of cases it is ignored. The Crown Office rightly directs attention to the fact that nowadays there are many excellent local anæsthetics, so that the production of general anæsthesia is not obligatory nearly so often as it used to be formerly. It must be remembered, however, that although local anæsthetics may in many cases suffice and be effective, yet they are not wholly without risk of serious consequences. Freezing is sometimes followed by extensive sloughing, and, unless the strictest canons of asepsis are observed, injections into the tissues involve a grave risk of infection and septicæmia.

It will be well, however, that the word of friendly warning, if it may be called so, which the Lord Advocate has seen fit to address to the dental profession should be taken to heart. It will be generally admitted that during late years great advances have been made in the methods of producing local anæsthesia, and that they are admirably suited to a great number of dental operations for which formerly gas or chloroform were administered.

If, however, a general anæsthetic must be used, it is only reasonable to demand that the dentist should exercise the same precautions in regard to his patient as the surgeon does in the performance of purely surgical operations.

Kissing the Book.

At a time when England is supposed to be about to cast aside her Conservatism and to begin a new and a better life, it is not out of place to call attention to the extraordinary tenacity with which our neighbour clings to certain bad habits. Notwithstanding the fact that "smacking the calfskin," as James Radcliffe in the "Heart of Midlothian" called it, or, more politely, "Kissing the Book," is a form of taking the oath in courts of law which has neither simplicity nor solemnity to commend it, and which nowadays is almost universally condemned, as a practice not without danger to health, our friends across the border, high and low, rich and poor, refuse to be reformed. They love their old customs, and it is amusing to watch how eagerly the hand of the witness goes out for the Book, and with what *empressement* he carries it to his lips, scornfully unheedful of the fact that thousands of other lips have done the same—and yet, ask the self-same person to drink out of a glass which other lips have touched, and he will turn from you with a look of indignation and abhorrence at the idea.

This affection for a disgusting practice is not born of necessity, because so long ago as 1888 the Oaths Act, 51 & 52 Vict. cap. 46, was passed, whereby the swearing by uplifted hand, or the Scotch form of oath, as it is called, was made legal in English courts of law. The manner in which this came about is interesting. In 1888 the late Mr. Charles Bradlaugh brought in a Bill exempting those who, like himself, had no religious belief from the necessity of taking an oath, and permitting them to affirm. The late Mr. W. P. Sinclair of Liverpool, then one of the members for Belfast, a presbyterian, wishing to relieve himself and his co-religionists from the annoyance to which they were subjected by being questioned as to their religion, asked Mr. Bradlaugh if he would permit a section to be added to his Bill, giving to those who wished it the privilege of being sworn as in Scotland, without question. This was done, and the Act passed as above stated.

We do not flatter ourselves that any words of ours will have any more weight than those of Mr. Frederick Lowndes of Liverpool, who, in season and out of season, has attempted to make his countrymen see the error of their ways. We would, however, venture to appeal to those lay persons who everywhere figure so prominently at meetings called together to discuss the "tuberculosis problem," to give a little practical assistance to this great cause by their example in refusing to kiss the Book.

The resignation of the Chair of Forensic Medicine by Sir Henry Littlejohn is the fitting conclusion to his remarkable career as a teacher. For fifty years without interruption he has lectured to successive generations of students, both of law and medicine, and now that he has reached his eightieth year, although unconscious of any loss of health or vigour, he feels that he is entitled to stand aside and allow the torch of learning to be placed in younger hands. This is not the place to review the life of the retiring Professor, but it may be truly said that the Edinburgh Medical School owes him a debt of gratitude which it can never pay.

The appointment of Dr. R. J. A. Berry to the Chair of Anatomy in the University of Melbourne, while a subject of congratulation to this rising University and to the new Professor, represents a loss to Edinburgh of one of her most efficient and devoted teachers.

Dr. Berry's many services to Alma Mater have been recognised by a presentation of plate, and on the eve of his departure for Australia he was entertained to dinner, a farewell function at which Professor D. J. Cunningham presided with great acceptance.

It is with great satisfaction we have to record the success of Dr. Marion Gilchrist and Dr. John Carswell in the action recently brought against them by a patient whom they had certified to be insane. We can assure our colleagues that they have the sincere sympathy of the profession in the East of Scotland, and we hope that this may find expression in some tangible form.

At the meeting of the Edinburgh Medico-Chirurgical Society to be held on Wednesday evening, January 17, Captain Greig, the distinguished head of the last Commission on Sleeping Sickness, is to read a paper on the disease, accompanied with lantern demonstrations.

We much regret to learn of the indisposition of Dr. P. A. Young, Treasurer of the Royal College of Physicians, and we trust that one who is so universally esteemed may soon be completely restored to health.

ORIGINAL COMMUNICATIONS.

THE ERECTION OF MUNICIPAL DISPENSARIES, AND A COMPLETER ORGANISATION AGAINST TUBERCULOSIS.[1]

By R. W. Philip, M.A., M.D., F.R.S.E., *Senior Physician to the Royal Victoria Hospital for Consumption, Edinburgh.*

In discussions bearing on the prevention of tuberculosis, there is sometimes a tendency to give expression to proposals which are either hastily formed or more or less academic in character, and from which little can be hoped towards the practical solution of the problem.

In briefly submitting the views which follow regarding a completer organisation against pulmonary tuberculosis, may I assure the Congress that the opinions are not speculative, but are the outcome of experience gained through eighteen years, during which it has been my lot to endeavour to elaborate a plan of campaign against tuberculosis in the city of Edinburgh.

Most existing movements against tuberculosis fail in attaining all they might, because they are too partial. In many centres throughout the world, Anti-tuberculosis Societies have been founded. The intentions of these have been good, but in practice less has been effected than is to be desired, from insufficiency in the plan of operations. Excellent as much of the work has been, there is too generally lacking the element of efficient organisation.

Through the agency of such societies there has been disseminated a large amount of serviceable information regarding the nature and prevention of the disease, and public interest in the subject has been aroused. Under the ægis of such societies, or other charitable or public bodies, provision has been made for the treatment of a certain number of cases of tuberculosis. Sanatoria have been founded in many places for the curative treatment of more hopeful cases, and hospitals or asylums have been established for the reception of patients in more advanced stages of the disease. Some communities have favoured attacking the early cases, and aimed specially at the cure, or at least the relief, of the individual; while others have attacked specially the later cases, with a view to preventive treatment.

In not a few instances the conception of founding sanatoria has bulked too largely in anti-tuberculosis movements. The public have been led to expect too much from sanatorium régime, in respect both of individual cures and of the extinction of the disease. As the results of sanatorium treatment accumulate, and as these are found less uniformly good than the hopefulness of the over-sanguine had expected, there begins to be manifested a feeling of disappointment and almost of annoyance. Already the question is being freely asked, "Are sanatoria worth while?"

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[1] Read before the International Congress of Tuberculosis, Paris, October 1905.

It is not the purpose of the present paper to refute the view that sanatorium treatment is a failure. To anyone familiar with the facts this will appear needless. The sanatorium constitutes an important division of the work. But the problem of the extermination of tuberculosis is too vast to be solved in so simple a fashion. The outlook of the sanatorium is towards the recovery of a certain proportion of early cases. But the number of cases ultimately cured by sanatorium treatment is small in proportion to the major issue, namely, the suppression of the disease.

Tuberculosis is a disease of infectious nature, and as such must be treated on the same broad principles on which we treat other infections. While this is true, there are many difficulties of a practical nature. Although of infectious nature, tuberculosis is a peculiar disease—peculiar in respect of its mode of dissemination and the conditions of environment on which this depends, peculiar in the variety of its manifestations, and peculiar because of its commonly prolonged course. On these grounds, the plan of combating tuberculosis cannot be modelled entirely on those which have been found serviceable in the treatment of other fevers.

In view of the special conditions, more is necessary than the establishment of hospitals or sanatoria. A more complete organisation is needed. The extent of the issue demands that each city and district should have a special department of public health activity, devoted entirely to the handling of tuberculosis in all its manifestations. The responsibility for the establishment and maintenance of such a department should rest on the Local Authorities—Municipalities, Parish Councils, Boards of Guardians, and the corresponding bodies in different countries. In cities, then, the Tuberculosis Department will be municipal. It will naturally be placed under the direction of the Medical Officer of Health. It should, however, form a *separate and well-defined department of his activity.*

Confining our attention for the present to the needs of cities, the Municipal Tuberculosis Department will have to direct attention to several widely different aspects of the question. The department should include the following divisions, which must be in close organic relationship:[1]—

1. A Tuberculosis Dispensary, with functions to be detailed presently. This I regard as the centre of municipal operations—the uniting point of all the other agencies. In larger cities

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[1] This view has been urged by me in successive papers for many years. *Vide Brit. Med. Journ.*, London, July 23, 1898. Subsequent experience up to the present has strengthened the opinion. I am gratified, if somewhat amused, to find them advanced by more than one recent writer as original and fresh.

several dispensaries may be advisable, distributed in several parishes or wards.

2. A Sanatorium or Sanatoria for selected patients, with a view to the effective arrest of the disease.

3. A Hospital or Asylum for patients in advanced stages of the disease, with a view chiefly to limit the dissemination of infection.

4. A Colony for the after life and supervision of patients in whom the disease is sufficiently arrested to make selected open-air employment feasible and desirable—patients who would probably fall back again into disease if not under such supervision for a prolonged period. Such a colony might readily be made self-supporting.

Up to the present in Edinburgh we have attained—

1. *A Dispensary*—the Royal Victoria Dispensary for Consumption—in the heart of the city.

2. *A Sanatorium*—the Royal Victoria Hospital for Consumption—in the vicinity of the city, which receives two groups of patients: (*a*) For prolonged periods, till complete cure or definite arrest of disease is effected. (*b*) For shorter periods, in order that the patients may learn methods of treatment to be afterwards carried out at home. Some of the latter patients are resident in the hospital, while others are visitant at the hospital during the day, returning home at night.

3. The city proposes shortly to arrange a Hospital for patients in advanced stages of the disease.

4. A Colony is in process of development. Already a large proportion of the paid staff of the sanatorium are cured patients, who serve as gardeners, carpenters, engineers, bathmen, male attendants, and maid-servants. Such former patients receive board and a certain payment for their services, while remaining under the medical surveillance of the sanatorium.

It is more particularly of the Dispensary as a centre of operations that I wish on the present occasion to speak.

The Royal Victoria Dispensary for Consumption was commenced in 1887, as the first definite step towards the organisation of a campaign against tuberculosis in Edinburgh. Its object was to afford a central institution, towards which all poor persons affected with consumption might be directed. The programme of the institution was as follows:—

1. The reception and examination of patients at the dispensary, and the keeping of a record of every patient, with an account of his illness, history, surroundings, and present condition, the record being added to on each subsequent visit.

2. The bacteriological examination of expectoration and other discharges.

3. The instruction of patients how to treat themselves, and how to prevent or minimise the risk of infection to others.

4. The dispensing of necessary medicines, disinfectants, sputum

bottles, and, where the patient's condition seemed to warrant it, of food stuffs and the like.

5. The visitation of patients at their own homes by a qualified medical man and a specially trained nurse, for the double purpose of treatment and of investigation into the state of the dwelling, the general conditions of life, and the risk of infection to others.

6. The selection of more likely patients for hospital treatment, either of early cases for the sanatorium or of late cases for incurable homes, and the supervision of patients, after discharge from the sanatorium, when necessary.

7. The guidance, generally, of consumptives and friends of patients, and for inquiries on all questions related to consumption.

During the past eighteen years this programme has been carried out by a staff of doctors, nurses, and a Samaritan Committee of ladies. The names of 14,750 individual patients are in the dispensary books. Last year alone there were in all 17,556 attendances. As many as eighty-seven patients have attended on one day. A very large number have been closely supervised at their own homes.

In addition to the routine work of the dispensary, detailed investigations are carried out with a view to ascertain the distribution of tuberculosis in the city. These include a systematic record as to the home conditions of the patient, according to the accompanying schedule, the inquiry being carefully undertaken at the patient's home by a trained nurse, under the superintendence of one of the medical officers. There has been thus accumulated a considerable mass of valuable statistics and information regarding the incidence of the disease in the district. These are steadily added to from day to day. No difficulty whatever has been experienced in obtaining the desired information.

A recent analysis of 500 of these records has yielded important facts with reference to the disease. Thus important details have been obtained as to the frequency of the disease in children and in housewives; its recurrence in certain houses and streets; its association with varying insanitary conditions of dwellings; the extreme frequency with which one or more persons share a room, or even a bed, with the consumptive patient; the varying amount of fresh air admitted into the dwellings by day and by night; the extraordinary extent to which the household washing is done in the affected dwelling-house; the frequency with which the consumptive patient changes his house, thus multiplying the infection again and again; the frequency with which a previous family or house infection can be traced; the entire absence, in the majority of cases, of precautions with a view to disinfection, either during or after the illness; and the effect of the disease in producing physical and financial distress in a more or less wide family circle. These may serve as examples of the important results obtainable by a systematised inquiry through the medium of a well-organised dispensary.

The establishment of the Royal Victoria Dispensary was, so far as I am aware, the first attempt to deal in more systematised fashion with the great crowd of tuberculous city poor. It has been my fortune, since its foundation, to be in constant touch with every department of its operations; and it is from experience thus obtained that I venture to recommend the system in its main features as a desirable one in every large centre. I should like to have it clearly understood that such a dispensary is a much more elaborate institution than exists in relation to the out-patient departments of consumption or other hospitals. The latter, doubtless, do excellent work so far as their resources allow. Their effort is, however, primarily directed towards the treatment of the individual patient, and little attention is directed towards the wider aspect of the tuberculosis problem.

Within recent years the idea of tuberculosis dispensaries has apparently occurred independently to workers in other countries. Dispensaries resembling more or less that which I have described have been founded, especially in France and Belgium. In this connection I may be permitted to pay a special tribute to the work effected by Prof. Calmette of the Pasteur Institute, Lille, to whom is due the establishment of the Emile Roux Anti-Tuberculous Dispensary, founded in 1900. In Germany also there has been expressed a strong feeling, during the last year or two, in favour of the development of institutions of the dispensary type —*Wohlfahrtstellen für Lungenkranke.*

As to maintenance. Up to the present, the Royal Victoria Dispensary and, so far as I am aware, the other dispensaries which have been erected from time to time in France and elsewhere, have been maintained by voluntary effort. Experience in the foundation and development of the Royal Victoria Dispensary has led me to the conviction that the extensive ramifications of the disease demand that the central dispensary, as a base of operations, should be maintained and worked by the Local Authority; in the case of cities, by Municipalities. Each community must face the question for itself, in the interests of the public health no less than in the interests of the affected individual.

As to actual cost. This is relatively trifling. For a sum varying from £500 to £1000, according to the extent of the operations, a sufficient organisation of the kind may be maintained in a city such as Edinburgh. Having regard to the extent of operations, the outlay is small. The advantages accruing to the community are incalculable, and should thoroughly justify the discharge of public money for the purpose.

APPENDIX.

ROYAL VICTORIA DISPENSARY FOR CONSUMPTION.

SCHEDULE OF INQUIRY REGARDING DISPENSARY PATIENTS.

No. in Ledger........... *Date of Report*.................

Name ? Age ?
Address ? Married or single ?
Occupation ? Has patient changed occupation ?
Able to work full time ? Or part time ?
If unable, confined to bed ?
How long ill ?
Situation of house (area, ground floor, 1st, etc.) ?
Number and ages of inmates ?
Number and description of rooms ?
General aspect of house (clean, damp, dusty, smelly) ?
Number of windows ? Can they open ?
Are they kept open (*a*) by day ?
(*b*) by night ?
Have they always been kept open ?
Does patient sleep alone (*a*) in bed ?
(*b*) in room ?
How is washing of clothes done ?
How long in present house ?
If has moved within two years, previous addresses ?
Have there been illnesses or deaths in house ?
(*a*) In own time ?
(*b*) In previous occupancy ?
Exposed to infection (*a*) at home ?
(*b*) at work ?
(*c*) among friends ?
Present health of other members of household ?
What precautions taken to disinfect ?
T. B. in sputum ?
T. B. in dust of room ?
General dietary ? Teetotal ?
General condition (well-to-do, badly off) ?
Proximate income of household ?
Assisted by societies, church, friends, rates ?

Signed............................*Reporter.*

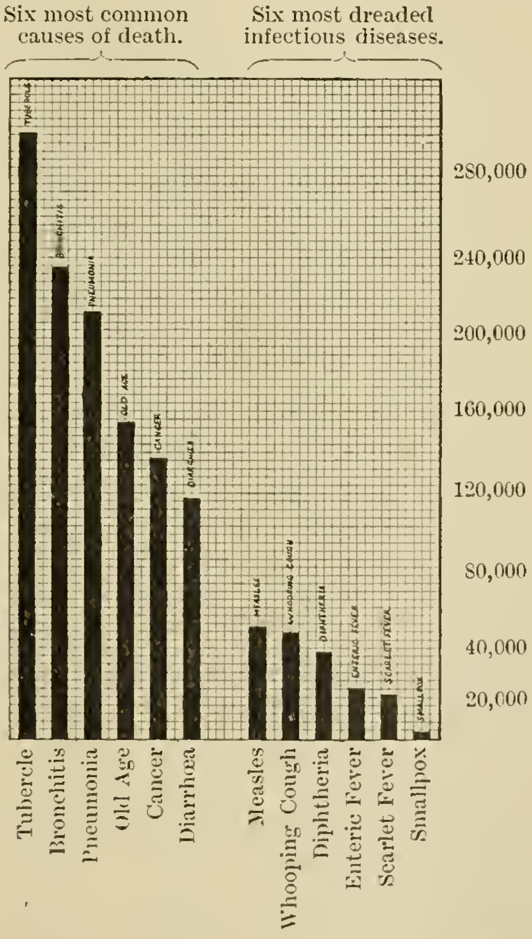
............................*Medical Officer.*

THE DUTY OF THE MUNICIPALITY IN THE PREVENTION OF TUBERCULOSIS.

By John Robertson, M.D., B.Sc., *Medical Officer of Health, Birmingham.*

It will be convenient before considering the duties of the municipality in regard to tuberculosis, to briefly enumerate some of the facts in regard to the prevalence and prevention of this disease which are either indisputable or so generally accepted as to make them available for basing definite action on.

In the first place, then, the most obvious and appalling observation which thrusts itself on every municipality is that this cause of death is the most serious we know of. Year by year it carries off more people than any other. How serious it is is indicated graphically in the accompanying chart, where the deaths are compared for a five years' period in England with those from some other causes in the same years.



Then, again, there are two obviously noticeable facts in regard to this disease—(*a*) That the majority of its victims are young adults who are just becoming useful to the community and by whose deaths the expense of education and training is entirely lost; (*b*) that the duration of the illness in each case is on an average probably longer and more expensive than any other. One might without exaggeration reckon on an average of at least two years for each case. But what weighs most heavily with all municipalities is that tuberculosis is a germ disease, and therefore to a large extent is preventible. Indeed, when a wide survey is taken of the history and prospects, one is tempted to assert that it is certainly preventible.

TABLE.—*Phthisis. England and Wales.*

Registration County.	Average Death-rate per million, 1869–1873.		Average Death-rate per million, 1899–1903.		Decrease per cent.	
	Males.	Females.	Males.	Females.	Males.	Females.
London	3195	2240	2181	1200	32	46
Surrey	2422	1742	1358	854	44	51
Kent	2005	1960	1393	998	31	49
Sussex	2376	2237	1555	974	35	56
Hampshire	2500	2140	1731	1116	31	48
Berkshire	2237	2084	1225	784	45	62
Middlesex	2355	1917	1272	866	46	55
Hertfordshire	1810	1820	1399	882	23	52
Buckinghamshire	1651	2019	992	849	40	58
Oxfordshire	2090	2050	1164	805	44	61
Northamptonshire	1906	2202	1238	962	35	56
Huntingdonshire	1975	2260	1094	880	45	61
Bedfordshire	2140	2589	1172	1000	45	61
Cambridgeshire	2164	2139	1217	952	44	56
Essex	2051	2053	1275	872	38	58
Suffolk	2057	2430	1303	1032	37	58
Norfolk	2040	2202	1066	981	48	55
Wiltshire	1864	1890	864	812	54	57
Dorsetshire	1740	1909	1013	939	42	51
Devonshire	2257	2197	1397	1140	38	48
Cornwall	2510	2190	1525	992	39	55
Somersetshire	1810	1768	1126	852	38	52
Gloucestershire	2111	1886	1298	1001	39	47
Herefordshire	1610	1653	974	895	39	46
Shropshire	1866	1922	1075	873	42	55
Staffordshire	1802	1852	1200	883	33	52
Worcestershire	1625	1636	1108	816	32	50
Warwickshire	2380	1867	1771	973	26	48
Leicestershire	1885	2191	1235	875	34	60
Rutlandshire	1372	1880	775	769	43	59
Lincolnshire	1670	2120	1048	965	37	54
Nottinghamshire	2019	2462	1160	980	43	60
Derbyshire	1852	2438	1040	854	44	65
Cheshire	2196	2311	1305	1046	41	55
Lancashire	2920	2735	1750	1218	40	56
Yorks W. Riding	2467	2512	1460	1020	41	60
Yorks E. ,,	2048	2206	1304	1092	36	51
Yorks N. ,,	1400	1691	1145	986	18	42
Durham	1971	2363	1313	1226	33	48
Northumberland	2465	2430	1758	1384	29	43
Cumberland	2400	2700	1256	1036	48	62
Westmorland	2027	2654	950	769	53	71
Monmouthshire	1854	2002	879	929	53	54
South Wales	2762	2677	1311	1277	53	52
North Wales	2688	2898	1600	1470	40	49

The extent of the havoc which it causes, the duration and expense of the illness, the age of its victims, and the obvious preventibility of the disease are then the points which have awakened the interest of those bodies, the municipalities, one of whose most important functions is the prevention of disease in all its forms. But every municipality has available certain statistical information which points to lines along which action is possible. There is the undoubted fact, even when due allowance is made for wrong diagnosis in early years, that the improved conditions under which the people live have enormously reduced the mortality year by year. For the whole of England and Wales the reduction is nearly equal to 50 per cent. in fifty years.

In the foregoing table I have set out for English counties the reduction which has occurred between the period 1869–1873, and the period 1899–1903—the clear interval between these periods being twenty-five years.

It will be noted that in every one of the counties throughout England and Wales there has been a reduction, the average in the case of males being 39 per cent., and in the case of females 54 per cent.; and one naturally asks why this has been so when no special effort has been made in the direction of reducing the mortality from tuberculous diseases.

It is often said that opinions formed by competent observers are of more importance than their arguments. In respect of the reduction above mentioned, the opinions of the most competent medical men, and indeed of everybody who has looked into the subject, are unanimous that the reduction is due chiefly to the improvement in the housing and feeding of the people, and the improved conditions of work-places and hours of labour. Indeed, the conviction that this is so is so strong, that all our best authorities realise that it is along similar lines that we must look for the most lasting effects of anti-tuberculous work. In passing, it may be noted that this reduction in the number of deaths from tuberculous diseases which has taken place of recent years is synchronous with an enormous increase in population in town districts, so that, in spite of the increased number of people who are subject to the conditions of town life, a reduction has taken place.

A sanitary authority has to ask itself whether there is a prospect of an even more rapid reduction in the death-rate from tuberculous diseases taking place were an active propaganda on broad lines adopted. From what we know, one may answer for the municipality that the outlook is distinctly hopeful along the lines of—(*a*) Getting rid of damp, ill-lighted, and ill-ventilated houses, and by the general adoption of a higher standard than we allow at the present time; (*b*) by still further doing away with the extremely unwholesome conditions which exist in a large number of work-places, especially those where workers are confined in ill-ventilated, dark, and unclean workshops for long hours.

We have somewhat remarkable figures for a number of towns, showing the intimate relation between the prevalence of tuberculosis and poverty, dirt, dampness, bad ventilation, and absence of sunlight. In the case of London, it will be recognised that the three districts marked with an asterisk are among the most objectionable, from a sanitary point of view, in the town, and it will be noted also that their mortality rates, based on an average of four years, are particularly high compared with the three other districts, which are occupied by people who are better housed and fed, and whose working conditions are infinitely superior.

Phthisis Death-rates per million in four years, 1901–1904:—

*Holborn	2955	Hampstead	832
*Southwark	2472	Lewisham	925
*Finsbury	2285	Wandsworth	1027

Similar figures for Birmingham are as follows:—

*St. Mary's Ward	2722	Edgbaston	855
*St. Bartholomew's Ward	2472	Saltley	1050
*St. Stephen's Ward	2297	Rotton Park	1147

Examples such as the above might be multiplied indefinitely for every large town.

Before suggesting what the municipality may do on the broad general lines of improving the public health, and by so doing limiting the incidence of tuberculosis, it may be desirable to look at the evidence which exists in regard to its infectiousness.

Since Koch, in 1883, pointed out that the disease was due to a germ, numerous workers have demonstrated the life-history of the tubercle bacillus with a marvellous amount of detail. If one eliminates what is useless for present purposes, one has to recognise as leading features the following points—(*a*) That an infant is not born in an infected condition, but that the infection is something which takes place in after life; (*b*) that the tubercle bacillus gains access to the human body through the air or by means of certain foods; (*c*) that the amount of resistance to invasion varies enormously in different people and in the same person at different periods; (*d*) that once the bacillus gains access to the human body and commences to grow, its growth is generally extremely slow, and for practical purposes no bacilli are thrown off from the human body except by means of the sputum, or by the fine particles which are coughed out during coughing or even during loud speaking, etc.; (*e*) that the bacilli which are ejected from cases of tuberculosis of the lung are capable of being dried and ground into dust and distributed over wide areas, and that, generally speaking, it is this sputum question which has to be dealt with in any active anti-tuberculosis propaganda.

There are, therefore, two well-defined lines along which the municipality must take action to prevent this extremely fatal disease. One is the bettering of the conditions under which the individual lives, so as to make his resistance to the disease greater;

and the other is the prevention of infective material being blown about and thereby doing harm.

In regard to the first and perhaps the most important of these, a great deal of progress is being made at the present time. It is questionable as to whether our standard of what is sufficient light and ventilation meets all the conditions which have been proved to induce tuberculosis. The ordinary sanitary administration has to see that damp, ill-lighted, and ill-ventilated houses are done away with. There appears to be a considerable divergence of opinion when one comes to border-line properties, and too often a charge of faddism is very unjustly made against the public health authority who endeavours to get rid of a house which has been in the same condition for the past fifty or a hundred years.

It cannot be too frequently remembered that our evidence in regard to this matter is so much better now that we are entitled to ask that the community should be very much better housed than it was in former years, and that any degree of want of light in the house or of want of sufficient air supply, or particularly of both together, should be made a ground for the local authority taking action. The housing problem is in its infancy at the present time, but it is being actively considered in many districts of the country, and there seems to be a real prospect in the near future of those material alterations in our land laws taking place which will enable progress to be made. With the abolition of old, worn-out properties, damp buildings are being done away with, and also ill-lighted and ill-ventilated houses, and in addition buildings which contain enormous amounts of filth hidden behind skirting boards and underneath floors, etc.,—filth which is stored and given up at intervals to the fresh occupants of the houses.

Municipalities have recognised the obvious thriftlessness of a large number of the poorer class inhabitants of big towns, together with their want of cleanliness, and have appointed teachers in the person of health visitors and women inspectors, who are doubtless doing some amount of good in getting greater cleanliness in the homes of the poorer classes. It might here be pointed out that probably one of the most difficult problems to face in the near future is that of thriftlessness and dirt among the working classes. Closely allied as a definite predisposing cause of tuberculosis is the condition of chronic alcoholism.

In regard to the second portion of the anti-tuberculosis propaganda, the first essential condition which one would lay down is that every case should be reported to the sanitary authority. In this respect it is particularly interesting to note that almost exactly the same sequence of events is taking place now in regard to this question of notification of cases of tuberculosis as took place twenty-five years ago, when the question of the notification of the acute infectious diseases came before the public. Then, as now, it was recommended that in the first instance cases should be voluntarily notified. Large numbers of the general public and of the medical profession grouped themselves on one side or the other. In our own profession several of the most important medical corporations in the country expressed decided opinions against compulsory notification of infectious diseases.

From my own experience, I can assert that, with properly arranged machinery, there is no more difficulty in working the compulsory notification of tuberculosis than there is in working that of any infectious disease. If one looks into all the pros and cons of the question, any impartial critic is bound to admit that the argument is distinctly in favour of notification of all cases of tuberculosis of the lung.

Among the reasons that I would urge for the compulsory notification of cases of tuberculosis are the following :—

1. The private medical attendant in nine cases out of ten has to concern himself with the medical treatment of the case, as distinguished from the prevention of spread of the disease ; and at the present time, where there is no notification, there is, one finds, in practice very little attention paid to the steps which should be taken in preventing the patient from spreading the disease to others. Where notification is generally adopted, it will be possible to get in the larger districts skilled persons to devote their time to ensuring, within reasonable limits, that the infectious person carries out the very simple precautions that are known to be necessary to prevent the disease spreading.

2. By getting to know in a systematic manner all cases of tuberculosis of the lung, statistics will in time accumulate on the important points in the etiology of the disease. At the present time, for instance, our figures, based on inquiries made after death, are of little value in demonstrating the conditions which obtained at an early stage of the disease.

3. Such notification will enable disinfection and cleansing to be looked after in a systematic and regular fashion.

4. It will draw particular attention to the fact that the disease may be spread if the sufferer is not careful.

There have been certain arguments raised against this notification. In the first place, it is said that tuberculosis is a slow, tedious disease when compared with scarlet fever, smallpox, or measles, of an entirely different nature to such infectious diseases, and therefore should not be dealt with by notification. There has always seemed to me to be a fallacy in this ; for a disease which remains infectious for two years, instead of two or three weeks, seems to me to be one which equally requires attention, provided that the regulations which are applied to it are suitable. It has always seemed to me to be quite a mistake to make a general law apply equally, as at present, to such widely different diseases etiologically as smallpox and typhoid fever. It will be an even greater mistake to apply the general law to cases of tuberculosis of the lung. When our Public Health Act, 1875, was passed, we did not know very much of the nature of infection, and of the different ways in which the different infectious diseases are transmitted from one to another.

Next to the general objection as to notifying the disease, on account of its differing from other infectious diseases, is that of the alarm which notification will give rise to. Within certain limits, is not this alarm the best possible means we have of drawing attention to the salient fact that tuberculosis is a result of conditions which lower vitality on the one hand, and spread infection on the other? To a certain extent, the more one demonstrates in a quiet and forcible manner these two points, the better it will be for the general community.

There is certainly nothing which need be done on the part of the public authority which will in any way damage the private individual; indeed, individuals will in the long run gain enormously, as it is probable that notification will bring with it a recognition of the fact that it is necessary that curative sanatoria should be provided for the poorer classes who are infected, and who are in an early stage of the disease.

I have had experience of dealing with a good many thousands of cases notified to the sanitary authority, both under a voluntary system and also under compulsory notification, and, except in one isolated instance, I have never known of the smallest amount of harm being done. The instance in which harm was done to the individual was as follows:—

A nurse-maid, who had the care of two delicate infants, and the general supervision over four other children, was suffering from phthisis, and in a highly infectious condition, and when her case was notified the usual inquiries were made. The girl was warned as to the risk which she was running, but in the first instance she took no notice; and it was not until we insisted on her reporting the matter to her mistress that she did so, with the result that she was sent away, feeling that she had been somewhat unjustly treated.

It must always be sufficiently recognised that compulsory notification is confidential. The sanitary authority must remember this; for if they did not, then an action for damages would very soon bring not only one but many sanitary authorities to recognise the point. There is no necessity in these cases to communicate the fact to any outsider. It is certainly not necessary to keep the bread-winner from work, provided he follows the instructions as to the disposal of the spit.

There are a number of other minor objections, such as, for instance, that a case of consumption may be reported by a number of medical men. In practice there is no difficulty in this. There is also the alleged objection that notification will not result in the reduction of the number of cases. My own opinion as regards this is, that this might probably be the case for the first few years, but in the long run the incidence of this disease will be materially reduced as a result of the notification of every infective case.

Voluntary notification has been adopted in a good many districts of the country, and is said to be effective. So far as the notification of cases among the poorest class of the community is concerned, it is effective; but among the large working-class population and the upper classes it is not. There is no general recognition of the necessity for notification. It is something which is at present recommended as advisable rather than absolutely necessary; but my strong conviction is that it is absolutely necessary, and that there should be no alternative.

This was the main reason which led me to suggest to the Sheffield Corporation some years ago the advisability of applying for powers for the compulsory notification of tuberculosis of the lung. But, in addition to this, another reason which weighed with me, and which was constantly uppermost in my mind, was the fact that at the present time there is a serious liability on the part of any medical man who voluntarily notifies a case of tuberculosis to proceedings being taken against him for doing something which was beneficial to the community as a whole, but which may damage the individual.

The clause in the Act of Parliament which gave us power to require compulsory notification in Sheffield is so interesting in itself, that I have had it printed *in extenso* below. Two important modifications of my original suggestions were made when the Bill was before the House of Commons. One was the comparatively trivial alteration in regard to the method of notifying and fees to be paid. The other was important. For, in the first instance, we asked that power should be given to take proceedings against the responsible person who did not take the simple and necessary means of destroying the infected material, namely, the spit. This, however, was not agreed to, and I still consider the omission to be one of the defects in what otherwise would be a model clause.

It will be noted that the clause, in addition to requiring every medical practitioner to notify cases of tuberculosis of the lung, separates the disease from all the other infectious diseases, so that no general legislation in regard to it can apply. It is therefore impossible under the Sheffield Act to prosecute a consumptive for exposing himself in the street, as it would have been had the disease been put under the general law.

The only other provisions of importance in the clause, which is unfortunately a long one, relate to the cleansing and disinfection of any building if this would tend to prevent or check tuberculosis of the lung, and the disinfection of books, bedding, clothing, etc., which have been infected. There is the ordinary proviso relating to any person who sustains damage by reason of the cleansing and disinfection of a house or the disinfection of clothing, etc., receiving full compensation.

Sheffield Corporation Act, 1903, *sect.* 45.

Provisions for notification of tuberculosis of the lung.—"*45.* 1. (*a*) Every registered medical practitioner attending on or called in to visit any person within the city shall forthwith, on becoming aware that such person is suffering from tuberculosis of the lung, send to the Medical Officer of Health a certificate on a form to be supplied to him gratuitously by the corporation, stating the name, age, sex, and place of residence and employment or occupation (so far as can be reasonably ascertained) of the person so suffering, and whether the case occurs in his private practice or in his practice as medical officer of any hospital, public body, friendly or other society or institution.

"(*b*) Any such medical practitioner who fails to give such certificate shall be liable, on summary conviction, to a fine not exceeding forty shillings.

"(*c*) The corporation shall pay to every such medical practitioner for each certificate duly sent by him in accordance with this section, a fee of two shillings and sixpence if the case occurs in his private practice, and of one shilling if the case occurs in his practice as medical officer of any hospital, public body, friendly or other society or institution.

"(*d*) A payment made to any medical practitioner in pursuance of this section shall not disqualify that practitioner from serving as a member of the corporation or as a guardian of a union situate wholly or partly in the city, or in any municipal or parochial office.

"2. (*a*) Where the Medical Officer of Health certifies that the cleansing and disinfecting of any building (including in that term any ship, vessel, boat, tent, shed, or similar structure used for human habitation) would tend to prevent or check tuberculosis of the lung, the town clerk shall give notice in writing to the owner or occupier of such building that the same or any part thereof will be cleansed and disinfected by the corporation, at the cost of the corporation, unless the owner or occupier of such building informs the corporation within twenty-four hours from the receipt of the notice that he will cleanse and disinfect the building, or the part thereof, to the satisfaction of the Medical Officer of Health within the time to be fixed in the notice. If within twenty-four hours from the receipt of such notice the owner or occupier of such building has not informed the corporation as aforesaid, or if, having so informed the corporation, he fails to have the building, or the part thereof, disinfected as aforesaid within the time fixed by the notice, the building, or the part thereof, shall be cleansed and disinfected by the officers, and at the cost of the corporation, under the superintendence of the Medical Officer of Health. Provided that any such building, or part thereof, may, without any such notice being given as aforesaid, but with the consent of the owner or occupier, be cleansed and disinfected by the officers of, and at the cost of, the corporation, under the superintendence of the Medical Officer of Health.

"(*b*) For the purpose of carrying into effect the provisions of this sub-section, the corporation may, by any officer authorised in that behalf, who shall produce his authority in writing, enter on any premises between the hours of ten o'clock in the forenoon and six o'clock in the afternoon.

"(*c*) Every person who shall wilfully obstruct any duly authorised officer of the corporation in carrying out the provision of this sub-section shall be liable to a penalty not exceeding forty shillings, and if the offence is a continuing one to a daily penalty not exceeding twenty shillings.

"3. (*a*) The Medical Officer of Health generally empowered by the corporation in that behalf may, by notice in writing, require the owner of any household or other articles, books, things, bedding, or clothing which have been exposed to the infection of tuberculosis of the lung, to cause the same to be delivered over to an officer of the corporation for removal for the purpose of disinfection, and any person who fails to comply with such requirement shall be liable, on summary conviction, to a penalty not exceeding five pounds.

"(*b*) Such articles, books, things, bedding, and clothing shall be disinfected by the corporation, and shall be brought back and delivered to the owner free of charge.

"4. If any person sustains any damage by reason of the exercise by the corporation of any of the powers of sub-section (2) and (3) of this section in relation to any matter as to which he is not himself in default, full compensation shall be made to such person by the corporation, and the amount of compensation shall be recoverable in, and in the case of dispute may be settled by, a Petty Sessional Court.

"5. No provisions contained in any general or local Act of Parliament relating to infectious disease shall apply to tuberculosis of the lung or proceedings relating thereto under this section.

"6. All expenses incurred by the corporation in carrying into effect the provisions of this section shall be chargeable on the district fund and general district rate.

"7. The corporation shall cause to be given public notice of the effect of the provisions of this section by advertisment in the local newspapers, and by handbills, and shall give formal notice thereof by registered post to every medical practitioner in the city, and any other registered medical practitioner known to be in practice in the city, and otherwise in such manner as the corporation think sufficient, and this section shall come into operation at such time, not being less than one month after the first publication of such an advertisement as aforesaid, as the corporation may fix.

"8. The provisions of this section shall cease to be in force within the city at the expiration of seven years from the date of the passing of this Act, unless they shall have been continued by Act of Parliament or by Provisional Order made by the Local Government Board and confirmed by Parliament, which Order the Local Government Board are hereby empowered to make in accordance with the provisions of the Public Health Act, 1875.

"9. The term 'Medical Officer of Health' in this section shall mean the Medical Officer of Health for the time being of the city, or any person duly authorised to act temporarily as Medical Officer of Health for the city."

Having obtained the notification of every case of tuberculosis, what then is the duty of the sanitary authority, as obviously without some action notification will be useless? The work may be divided into two parts.

In the first place, it is necessary to ensure by more or less frequent visits, as the case may require, that the sputum is being properly dealt with; and, in the second place, it is almost equally necessary that a periodical cleansing and disinfection of the apartments used by the consumptive should be made.

In addition, however, to these main duties, there are certain others which appear to be directly or indirectly duties which the municipality should undertake. One of these is the very obvious one of using the information gained for the benefit of the community. It is possible to acquire knowledge from a large number of consumptives as to the conditions under which they lived at the time they first became infected, and it is found that very useful information has already been obtained in Manchester, Sheffield, and many other towns from such inquiries, which cannot be made after death. There is also the duty on a local authority of providing in one way or another treatment for the curable cases and isolation for hopeless cases.

In the first instance, who should undertake the very delicate and responsible work of advising the person in charge of the consumptive as to the disposal of spit and other precautions which must be taken in order to prevent the spread of the disease? In certain towns, medical inspectors have been appointed by the municipality to do this work, while in others, lay inspectors have been engaged. My own experience has been entirely confined to lay inspectors, and I have been quite satisfied with the work of an intelligent layman so far as he can go.

But the training of such an inspector is a matter of considerable difficulty. He will examine the sanitary condition of the house, and he will record in most cases in an intelligent manner the history and circumstances of the case, but there are many points which will require medical supervision, and undoubtedly it is advisable that all the reports should be overhauled by a medical superintendent, who will visit and make inquiries when necessary to supplement those made by the lay inspector.

One of the disadvantages, however, of appointing a lay inspector is that, while he is able in most cases to suggest the proper way of dealing with the sputum, and of disinfecting the house at intervals, he ought not to be expected to give direction as to change of occupation, or, in many cases, as to change of house. In the case of the lay inspector, his instructions need never clash with those given by the medical man in attendance, as he ought always to ascertain whether the patient is being attended by a medical man before he gives any instructions at all. One of the probable disadvantages of a medical inspector is that his opinion might clash with the medical attendant occasionally, as he would be able to give more detailed instructions.

One of the very important questions which the inspector appointed by the local authority will have to deal with is to see that the sputum is properly disposed of, and this is a matter of very much greater difficulty than would appear at first. A proper spittoon at home and a pocket spittoon to use out of doors so as to allow the sputum to be destroyed afterwards is a simple matter. By a good many municipalities cheap pocket spittoons are provided free of cost in order to limit the spread of infection. The difficulty comes in, however, from the fact that a very large amount of infectious matter is ejected by many consumptives when they cough. In practice it is very difficult to impress the consumptive with the importance of this, and with the necessity of taking means to prevent the diffusion of tubercle bacilli over a room by coughing. The only method I have suggested of stopping this diffusion is to get the consumptive to cough into a Japanese handkerchief or rag; and for this purpose certain sanitary authorities have provided a supply of these cheap handkerchiefs for certain of the cases where there is a danger of this taking place.

There appears to be a real necessity for a home for the segregation of a number of consumptives who are in an advanced stage of the disease, and who, rightly or wrongly, refuse to take advantage of the Poor Law institutions. Such hospitals or homes are essentially means of preventing the spread of the disease, by taking these highly infectious people from crowded dwellings, where there is a serious drain on the means of the family, and putting them under comfortable conditions, where they are not a danger to the community. The Poor Law authorities do not and cannot deal with all the cases which come under this category, and therefore it appears to be a duty of the municipality to make such provision.

The question has often been discussed within recent years as to whether the municipality should not at the same time provide a sanatorium; and although many municipalities throughout the country have directly or indirectly assisted in maintaining sanatoria, none have, I think, done so on quite the best possible lines. In a good many instances the sanatorium has been provided by private beneficence; Manchester, Liverpool, London, and a number of other towns have had public-spirited men come forward and make the necessary provision, but in a very large number of cases no provision has as yet been made, and one has the fact staring him in the face that in every community there are a number of young men and women who are in an early stage of the disease, and who would be permanently benefited by sanatorium treatment. Indeed, in a considerable number of cases there can be no doubt whatever but that sanatorium treatment would mean the complete arrest of the disease. At the present time one has to stand by and see these quite desirable citizens fail for want of such provision.

It has been contended that a sanatorium is not a means of preventing infection, but against such a statement there is the fact that probably every person who is permanently benefited in a sanatorium is prevented later on from becoming a danger to the community. Again, there is the point that the sanatorium is a most excellent means of teaching preventive measures, and that after a community has had the experience of a properly equipped sanatorium and the results of its treatment, they are better able to appreciate the necessity for increased vigour in dealing with cases of the disease. It is doubtful, too, whether people do not themselves prefer to provide a sanatorium rather than to accept charity on all occasions when they are ill. There is a good deal to be said against the indiscriminate acceptance of charity.

A municipal sanatorium, if worked on the best lines, ought to have certain distinct advantages over almost any similar institution worked as a charity. In the first instance, it is almost certain that a stay of three or four months in a sanatorium is insufficient in the case of the working classes to ensure permanent good results even in the selected cases; and one of the advantages which a municipal sanatorium will have is that it will be possible to exercise a certain amount of supervision over the people in the municipal district after they have left the institution. I have elsewhere suggested that this supervision should be carried out by a qualified medical man, who would visit and advise for at least a couple of years after the patient is discharged from the sanatorium, and whose duty it would be to as far as practicable see that the conditions in the home and at the works were reasonably suitable for a consumptive.

The utility of a sanatorium must be limited. In the first instance, one would suggest that no case of tuberculosis should be admitted in regard to which permanent good results were not likely to follow. In addition, however, to dealing with this comparatively small group of patients, it will be possible in the large towns to establish at the general hospitals tuberculosis cliniques under specialists, at which cliniques recommendations as to preventive measures and preventive treatment would be a leading feature. Such cliniques would enable the suitable cases to be picked out for transference to the sanatorium, while others among the hospital cases would receive instructions as to the best treat ment to be adopted at home.

TWO CASES OF POISONING WITH ARSENIOUS ACID IN WHICH THE YELLOW SULPHIDE OF ARSENIC WAS FOUND IN THE ALIMENTARY CANAL.

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The restriction which the law places upon the sale of arsenic has undoubtedly tended to greatly diminish the use of this substance by the criminal for homicidal purposes, and it is a striking fact that during the ten years 1893–1902 no deaths were recorded by the Registrar-General from its employment in this manner throughout Great Britain. Accidental and suicidal deaths are also not very frequent, more especially in Scotland, as the following table indicates:—

Deaths due to Arsenic in England, Wales, and Scotland during ten years, 1893–1902.

Year.	England and Wales.		Scotland.	
	Accident.	Suicide.	Accident.	Suicide.
1893	4	5	...	...
1894	5	8	...	2
1895	3	4	1	1
1896	4	5	1	...
1897	3	6	...	...
1898	3	4	1	...
1899	3	2	2	...
1900	11	5	1	1
1901	76[1]	2	...	1
1902	8	6	...	...
Total	120	47	6	5

Possibly the ease with which other equally active and more quickly fatal poisons, such as carbolic and oxalic acids, may be readily obtained without exciting the same amount of notice, has tended to make poisoning by arsenic a much less frequent cause of death than in former years.

On this account, as well as because they present many points of interest, the two following cases which have recently come under our notice are recorded. They serve to indicate, moreover, that, even at the present time, arsenic is possibly a more frequent cause of death than the Registrar-General's statistics lead us to believe, and that, unless a post-mortem examination is held in all cases of unexpected death, or of persons dying without medical treatment, the fact of poisoning may elude discovery.

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[1] Thirty of these are returned as due to arsenical beer, but in all probability many more of the cases arose from this cause.

It is a popular and not uncommon idea that the symptoms of poisoning are, as a rule, clear and decisive, and that a medical man called in to view the body after death should be able to express a definite opinion on the subject.

This is, however, not so, because, in the first place, there are very few poisons which leave any external traces of their administration, or which, from their odour, can enable a medical man even to hazard the opinion that a poison has been taken. In the second place, it has to be remembered that even in acute and rapidly fatal cases of poisoning, the symptoms may not be characteristic. In the class of poisons in which, as a rule, symptoms are well marked, namely, the metallic irritants, they may be wholly absent, or present only in such a modified form as not to arouse the slightest suspicion. Indeed, such typical symptoms of irritant poisoning as vomiting, purging, and pain in the abdomen, anomalous as the statement may appear, are more frequently presented by patients who are not suffering from poisoning at all, but from a rupture of a gastric or intestinal ulcer, intussusception, rupture of an extra-uterine pregnancy, or some other acute abdominal condition.

With the Klosowsky or Chapman case in our recollections, it is not necessary to emphasise the fact that in the chronic administration of irritant poisons, the symptoms produced may deceive even the most careful and observant medical man.

The following is an account of the two cases which we desire to record. In one of these we only received certain organs for analysis; but in the other, one of us had the opportunity of making the post-mortem examination, and also of personally inquiring into the circumstances attending the death.

Case 1.—J. M., æt. 24, on the afternoon of 10th October went to a neighbouring town, ostensibly to withdraw money from the bank, and to purchase furniture, etc., in view of his marriage, which was fixed to take place in three weeks. At 4 p.m. he called upon a relation in the town, and had a drink of whisky with him. Nothing unusual was noticed in his manner at this time, and he seemed cheerful and quite well. Shortly afterwards he left his friend's house, saying he must go to the bank before it closed. Instead, however, of going there (where it was afterwards found he had no money), he called at the house of another friend, and partook of tea and some cake. He left here at 6.15 p.m., and, as subsequent investigations proved, visited a chemist's shop, where he purchased a packet of "rat poison," consisting of arsenic mixed with soot. He asked the chemist particularly how it should be administered to rats. At 7 p.m. he met some friends by appointment at the station. He went shopping with them, chose furniture, arranged for the marriage breakfast, etc., but it is stated that he did not appear to take much interest in the matter. He also bought some sugar-candy, which he and his friends ate in the train on the way home. He got out of the train at the station before his own, and went with his friends to their house. It was noticed that he was looking very pale, and that his eyes appeared red and bloodshot; but on someone remarking that he seemed to have a headache, he said he had not a sore head, but felt "awful queer." He had supper with his friends (9 P.M.), consisting of tea, cake, scones, and cheese, and made a hearty meal. It was noticed that he drank off his first cup of tea with avidity, stating that he was very thirsty. After supper he seemed better, although somewhat dull, and left to walk home at 10 P.M. Nobody heard him arrive home, but next morning, at 5.30 A.M., when his landlady called him as usual, in order that he should get up and go to his work, he said he had been sick since 2 A.M., and would therefore remain in bed for a little longer. He asked for a cup of tea, but he vomited it immediately after taking it. Frequently during the day (11th October) he was sick, and brought up small quantities of fluid. There was constant retching. The vomited matter had the appearance of bile, and it was thought that he was merely suffering from a bilious attack. About 7 P.M. a doctor was sent for, as he was very restless and tossing about in bed. The doctor was unable to come, but at 11 P.M. sent some antipyrin tabloids, with directions that two were to be taken at once, and two more three hours later. The landlady sat up with him until 2 A.M., and put hot bottles to his feet, as he said he was cold. He did not complain of pain anywhere. At 4 A.M. his condition was the same, but at 5.20 A.M. (12th October), twenty-seven hours after the onset of his symptoms, he was found lying dead in bed. He had not been sick since 2 A.M. on the morning of his death, and during the whole course of his illness there was no diarrhœa.

In the above account we have gone somewhat fully into the movements of the deceased prior to the onset of his illness, because, although the case was subsequently considered to be one of suicide, yet in the first instance this was by no means clear.

He gave no indication of an intention to do away with himself,—on the contrary, his letters to his relations when asking them to the marriage, his cheerfulness, his anxiety to make preparations for the wedding, all tended to disarm any such suspicion even if it had existed. The fact that he had purchased poison was also not discovered until some time after his death. It may, however, be remarked in this connection, that while to the layman the fact of a person dying suddenly who is about to be married is considered to be a circumstance against the probability of suicide, yet those who have experience of such cases know that the fact is rather in favour of it. We have had many opportunities of verifying this observation as regards men, but in our experience the same probability does not exist in the case of women under the same circumstances.

The history and symptoms of the case have also been detailed so far as they could be ascertained, because an interesting question is the determination of the time when the poison was taken.

A post-mortem examination was made two days after death, and the following account is taken from the report of the doctor:—

> "The mucous membrane of the cheeks, gums, and tongue was found considerably whitened, as was also the mucous membrane of the œsophagus, although in a less degree. The stomach, which contained a considerable quantity of light yellow liquid material, was much congested and inflamed at the pyloric end, showing at parts some extravasation of blood into the mucous membrane. Patches of the small intestine also were considerably congested. There was no characteristic odour about the mouth or contents of the stomach. The body otherwise presented no unusual appearances."

The medical examiner concluded from the condition of the intestinal tract that death was due to some irritant poison.

In consequence of this opinion, a chemical analysis was ordered by the Crown, and the following articles, which had been removed at the post-mortem examination, were received on 16th October:—The stomach, with 6 in. of œsophagus attached to it; a piece of small intestine about 8 in. in length; a piece of liver about the size of a small apple. All these parts were contained in one bottle, and were immersed in 4 oz. of fluid, presumably the contents of the stomach.

The manner in which these articles were sent for the purpose of analysis forms an admirable example of how this should not be done. Not only were the parts sent wholly insufficient for a proper quantitative analysis to be made, but, from their having been mixed together in the same bottle, it was impossible to determine whether a poison had existed in all of them, or was present only in the stomach, at the time of death. Had the case proved to be one in which another person was suspected of having administered poison, it might have been quite impossible to prove the crime in the face of such neglect of one of the most elementary rules of procedure on the part of a medical man in such circumstances.

On opening the bottle, there was a strong putrefactive odour, and the parts presented the following appearances:—

> *Stomach.*—This had been cut open along the lesser curvature. The peritoneal surface was smooth, and glistening with slight diffused redness (p.-m. ?) at the pyloric end, but nowhere any marked injection of vessels. At the cardiac end, slight greenish discoloration and some putrefactive emphysema. On its posterior external surface there were several diffused patches of a light yellow colour, more especially towards the pyloric end. These patches were irregular in shape, and the colouring matter was situated beneath the peritoneum, and had the appearance of a thin layer of yellow paint.

Internally, the cardiac half of the stomach presented a normal appearance. Towards the pyloric end the mucous membrane had a uniform deep red colour, to some extent, no doubt, the result of putrefactive changes, but due also to intense congestion. It was swollen, and like velvet in appearance. It was contracted into rugæ, which were suffused with extravasations of blood. There was no erosion or ulceration of the mucous membrane. The crests of the rugæ presented a most striking appearance. They were of a light yellow colour, and thus formed a yellow network over a considerable area of this part of the stomach. This yellow colour was found to be due to a granular substance deeply embedded in the mucous membrane, which could not be washed or scraped off without injuring the membrane. The deposits were limited solely to the crests of the rugæ, no other portions of the mucous membrane showing a similar coloration, neither did a careful search disclose the presence in the stomach of particles of soot or crystals of arsenious acid.

Œsophagus.—In the portion of this organ which was received, little could be made out. The external surface appeared to be normal, while internally the epithelial lining was absent; but whether this was due to accidental causes or to the action of an irritant, could not be determined.

Intestine.—This consisted of a portion of the jejunum, and showed, in addition to congestion of the peritoneum and mucous membrane, some yellow patches under the peritoneal coat similar to those seen on the external surface of the stomach, although not quite so distinct.

Liver.—The portion of liver received was becoming green and soft from putrefaction. It showed nothing of special significance.

The reddish-coloured fluid contained in the bottle amounted to 4 oz. On submitting a small quantity of this fluid to a test by Reinsch's process, the presence of arsenic in it was at once established. Owing to the various organs having been placed together in one bottle, it was considered useless to examine each separately. We accordingly contented ourselves with estimating the quantity of arsenic present in the fluid, which was presumably that contained originally in the stomach. This fluid, on being allowed to stand for a time, deposited a white sediment, which, on being examined microscopically, was seen to be crystalline, many of the crystals having a typical octahedral form. On washing the sediment and purifying it, it was found to consist of ·214 grm. of arsenious acid. The fluid was then treated in the ordinary way, by means of hydrochloric acid and chlorate of potash, to get rid of organic matter, and the arsenic precipitated by H_2S gas, etc. It was found to contain ·080 grm. of arsenious acid, so that the total quantity contained in the liquid was ·294 grm. The examination and analysis gave no indication of the presence of soot.

Portions of the yellow deposit from the rugæ, and also from underneath the peritoneum of the stomach and intestine, were examined in order to determine the nature of the pigment. Microscopically it showed no crystals. The colour disappeared on the addition of ammonia. On filtering this solution and evaporating off the ammonia, a yellow deposit was left. This deposit was dissolved in ammonia, and on testing gave the various reactions of arsenic.

The second case was as follows:—

Case 2.—A man, R. J., æt. 27, left his lodgings one morning after eating a hearty breakfast, being apparently in good health. He spent the day, so far as can be made out, drinking with friends, and between 4 and 5 P.M. came to his married sister's house. She states that he was not then the worse of drink, but complained of being tired. He appeared to be in his usual state of good health, and sat reading the newspapers until 8 P.M., when his brother-in-law came home. They had supper together, consisting of lentil soup and sausages. As it was a very wet night, his sister asked him to remain with them, which he agreed to. Between 9 and 10 o'clock, after going to bed, he complained of pain in his back, and began to retch. His sister states that he continued retching throughout the night, but she does not think he vomited. He was very thirsty, and drank a large quantity of water. He went twice to the water-closet during the night. At 4 A.M. he got up to go again to the closet, but fell down on his knees at the side of the bed, apparently from weakness. His sister, who helped him into bed, says that he then passed, involuntarily, a watery motion which showed no traces of blood in it. About an hour afterwards he died. There were no convulsions, and he appeared to be unconscious for some time before death. He had complained of pain in the back, but nowhere else.

In accordance with the usual practice in Edinburgh in cases in which death has occurred without a medical man having been in attendance, intimation of the occurrence was made by the sister to the police, and the body was removed to the mortuary.

The investigations of the police disclosed no suspicious circumstances, and the death was attributed to natural causes, connected with the intemperate life which the deceased had been leading for some time. No post-mortem examination was therefore ordered by the authorities, but we obtained permission from the friends to examine the body.

This took place on 6th April, fifty-two hours after death, and the following is an account of the conditions found:—

Body spare, but muscular and well developed. Limbs rigid, moderate amount of lividity in skin of dependent parts of body. Eyes prominent, life-like, and conjunctivæ injected. Slight greenish discoloration of the skin at the lower part of the abdomen. When the abdominal viscera were exposed to view by the usual preliminary incision, attention was at once attracted by a bright yellow colour on the surface of a coil of small intestine lying just below the duodenum. This yellow patch was fully the size of a two-shilling piece, its edges were sharply defined, and it conveyed the impression of an area of bright yellow paint underneath the peritoneum. The possibility of arsenical poisoning at once suggested itself, since in the first case, which occurred a few months before, a similar condition had been observed, although in that instance the colour was not so bright, nor were the yellow areas so well defined. The appearance was quite *sui generis*, and could not be confused with bile staining by anyone in the habit of making autopsies. Acting on the suspicion thus aroused, the examination of the abdominal viscera was first proceeded with.

The stomach was distended with gas. Its peritoneal coat was hyperæmic, and the large surface blood vessels were filled with dark fluid blood. It contained 12 oz. of a thin greyish-red-coloured fluid, with small masses of white flocculent material floating in it. The mucous membrane of the left half of the stomach was pale, and had a normal appearance. Towards the pylorus, and especially along the greater curvature, the internal surface was contracted into thick rugæ. The mucous membrane was swollen, and like rich crimson velvet. It was suffused with extravasated blood, while an area about the size of the palm of the hand was covered with a white pasty mass or exudate, in which white crystalline particles could be detected with a lens. In the spaces between the rugæ, and also for some distance around the pylorus, the mucous membrane, although hyperæmic, was not so highly inflamed, and showed no extravasations of blood, or exudate. There was no erosion or ulceration of the mucous membrane. In the duodenum just beyond the pyloric orifice, there was a small quantity of a yellow powder adhering to the mucous membrane. The mucous membrane of the duodenum, jejunum, and upper part of the ileum was uniformly red and inflamed, more especially the valvulæ conniventes, which were suffused with extravasations of blood. In the mucous membrane of the small intestine there were several areas of a light yellow colour, varying in size from a halfpenny to that of a five-shilling piece. These patches were not sharply defined, and were in some instances faint and liable to be overlooked. The signs of irritation diminished in the lower part of the ileum.

Under the peritoneal surface of the small intestines, in addition to the yellow patch already referred to, there were several other areas of yellow coloration, not quite so bright nor so well defined, but almost equally striking and suggestive of yellow paint, diffused in a thin layer in the tissues. On examining these patches with a lens, no visible granular structure was apparent; they did not correspond in position with the yellow patches seen on the mucous surface.

The small intestines contained about 20 oz. of a greyish-red fluid similar to that found in the stomach.

The cæcum presented several bright yellow patches on the mucous membrane, and one on the peritoneal surface, similar to those above described.

The large intestine was collapsed and empty, except for a small quantity of thin watery fluid. Its mucous membrane was red and inflamed in one or two places, and in the descending colon there were two areas of yellow coloration similar to the others. The mucous membrane of the upper part of the rectum showed patches of inflammatory redness.

The large mesenteric vessels were engorged with dark fluid blood. The mesenteric glands were soft and swollen.

The bladder contained about a teaspoonful of milky opaque urine. Its mucous membrane was not reddened.

The capsules of both kidneys were loosely adherent to the cortex, which was swollen and pale.

The liver was very fatty, and engorged with fluid blood. The gall bladder was distended with dark green bile. The spleen and pancreas presented a normal appearance.

The heart contained dark fluid blood. The heart muscle was firm, and appeared healthy. The right ventricle was dilated. Beneath the endocardium of the left ventricle there were numerous extravasations of blood. These varied from the size of a pea to that of a bean, and were situated on the septum and on the musculi papillares towards the apex of the heart.

The lungs were engorged with blood. There were no subpleural hæmorrhages.

The tongue was coated with a thick grey deposit. The mucous membrane of the lips and mouth was pale and moist. That of the fauces, larynx, and trachea was red and injected. The mucous membrane of the œsophagus was pale in its upper half. Towards the lower end it was loose and easily detached, and in parts had disappeared.

The vessels of the scalp, membranes of the brain, as well as of the brain itself, were engorged with dark blood.

As a result of the post-mortem examination, there could be no doubt that death had resulted from an irritant poison, in all probability arsenic. The application of Reinsch's process to a small portion of the contents of the stomach quickly decided this question, the copper becoming at once thickly coated, and on heating, it gave a copious sublimate of octahedral crystals of arsenious acid. The police were made acquainted with the facts now disclosed, and as a result of their further investigation of the case the following interesting circumstances were discovered :—

From a statment made by a friend of the deceased, it appears that the latter had told him that arsenic was a good "pick-me-up" for overcoming the effects of drink, and that he sometimes took it. He showed his friend a small box containing arsenic, which he said he had obtained at the electrical engineering works where he was employed as storekeeper, and which he carried about with him in his waistcoat pocket.

When expostulated with for taking such a dangerous substance, the deceased said he knew something about chemistry, and that a little arsenic after he had been drinking did him good. He was never seen to take any by his friend, nor yet by his sister when he came to her house, but on searching the house, the small tin box which he carried about with him was found in the room, empty, except for a few granules of white substance which analysis proved to be arsenious acid. Inquiries made at the works where the deceased had been employed confirmed the fact that arsenic was kept in the store which had been under the deceased's charge. There can be little doubt, therefore, that the case was one of suicide or of accidental death, and that the deceased had taken a quantity of the arsenic he was in the habit of carrying about with him. His landlady stated that about three weeks before his death he suffered from a severe attack of diarrhœa, which, in the light of the facts ascertained, may have been due to his having taken a dose of arsenic.

Chemical analysis.—Various organs of the body were first of all submitted to a qualitative test for the presence of arsenic, namely, that of Reinsch. The purity of all reagents was confirmed, and only the production of octahedral crystals by subliming the deposit on the copper was regarded as evidence of the presence of arsenic. Arsenic was thus proved to be present in the urine; blood from the inferior vena cava; bile; kidneys; spleen; liver; contents of the stomach, of the small intestine, and of the large intestine.

Only small quantities of these various organs and fluids were operated on, and in all instances an abundant crystalline sublimate was obtained. The cerebro-spinal fluid, as also the brain itself, gave negative results.

A quantitative analysis was made of the contents of the stomach, and of the small and large intestines. The method employed was: destruction of the organic matter with HCl and $KClO_3$, precipitation with H_2S gas, and weighing the arsenic as ammonio-magnesium arseniate.

The following amounts of arsenious acid were found to be present:—

Fluid contents of stomach .	0·220 grm.
,, ,, small intestine	0·163 ,,
,, ,, large ,,	0·040 ,,

When the case resolved itself into one of suicide, the authorities decided that a complete quantitative analysis was unnecessary. The stomach was therefore preserved as a museum specimen, and no attempt was made to estimate the amount of arsenic which was proved, both microscopically and chemically, to be present in the pasty mass before described.

Through an accident at the autopsy, a considerable quantity of the fluid contents of the small intestine was lost, so that, for these reasons, the total quantity of arsenic present in digestive canal must have been considerably greater than the amount indicated in the above results.

The whole of the liver having been removed from the body, it was decided to make a series of analyses of portions taken from different situations, with a view to determine whether the arsenic was equally distributed throughout the organ. Accordingly, five portions were taken from situations as widely apart as possible.

The whole liver weighed 2010 grms., and the weights of the respective portions taken for analysis, together with the quantities of arsenious acid found in each, were—

1. Middle of posterior surface . .	118 grms.	= 5·5 mgrms.	As_4O_6.
2. Centre of organ	269 ,,	= 17·1 ,,	,,
3. Middle of anterior border . .	112 ,,	= 5·1 ,,	,,
4. Left lobe, lateral margin . .	100 ,,	= 3·0 ,,	,,
5. Right lobe, lateral margin . .	148 ,,	= 6·6 ,,	,,

Results which show a fairly close approximation to each other when the unavoidable errors of an analysis, dealing with such comparatively small quantities, is allowed for.

The five estimations show an average of 5·0 mgrms. As_4O_6 per 100 grms. of liver substance, or in the whole liver an estimated total quantity of 0·100 grm.

The method of analysis employed.—Little difficulty is, as a rule, experienced in getting rid of organic matter when one has to deal with the contents of the stomach or intestines, which are chiefly fluid, or with such organs as the kidney, spleen, etc.

In such circumstances either the method of destroying organic matter with HCl and $KClO_3$, or the distillation process may be employed, with equally good results and with comparatively little trouble. Probably the simplest method is to use the distillation process, since by this means an almost clear liquid is directly produced ready for treatment with H_2S.

In dealing with the liver, however, which in this case was extremely fatty, considerable difficulties were met with, in connection with the employment of both of these processes.

In the first, that in which HCl and $KClO_3$ were employed, we found that not only was the process a most lengthy and tedious one, and that owing to the large quantity of fat present a considerable amount of indestructible residue remained, but also it was found difficult to secure for some reason complete and thorough saturation of the resultant fluid with H_2S. So unsatisfactory did this method appear to us, that we decided to employ the distillation method.

A portion of liver was accordingly divided into small pieces, and these were then dried over a water bath. Thereafter they were introduced into a retort with HCl, and, after being allowed to stand for a time, heat was applied. After several trials, however, distillation of the liver in this form had to be given up on account of "bumping," which no amount of care appeared able to overcome. The bumping was apparently due to the fat which formed a thick layer on the surface of the liquid. It seemed to us, therefore, that if the fat could be removed prior to distillation, the process might still be used and prove in many ways preferable to the HCl and $KClO_3$ method.

With this idea in view, we accordingly resolved to extract the fat from the pieces of liver after they had been dried as before and prior to placing them in the retort. The fat was therefore thoroughly extracted in a Soxhlet tube with ether, and after the ether had been evaporated, the pieces of liver thus deprived of fat were placed in a retort along with HCl, and distilled.

The distillation now proceeded without any trouble from bumping or frothing, and a clear distillate, practically colourless and free from organic matter, was obtained. It seems to us that such a method as that now indicated possesses distinct advantages, inasmuch as it renders the distillation process more feasible of application in the case of such an organ as the liver, which may contain a very considerable proportion of fat.

The abstraction of the fat prior to distillation is not open to objection so far as we can see, since arsenic is insoluble in ether.

We are aware that it is open to objection on account of a possible loss of arsenic during the process; but if the distillation is properly carried out, with due care and precautions, we do not think that the possible error is greater than in the case of other processes.

The method of procedure employed subsequent to destruction of the organic matter, in all instances, was the usual one, namely, precipitation with H_2S, dissolving the H_2S precipitate with NH_4OH, and then evaporating to dryness over a water bath. The residue was then oxidised with HNO_3, evaporated to dryness, and this residue dissolved in water and filtered. After the addition of magnesium mixture, the liquid was allowed to stand for twenty-four hours, when the precipitate was filtered off, ignited, and weighed. An allowance of arsenious acid was made for every 16 c.c. of filtrate from the magnesium arseniate precipitate.

The above cases are interesting in many respects. They tend to indicate how easily, under our present system of procedure, cases of poisoning may remain unrevealed where no doctor has been in attendance. In both of the cases we have recorded, neither in England or Scotland, in the present state of the law, would an autopsy have necessarily taken place prior to burial, with the result that these deaths would in all probability have been certified as due to natural causes. We could give several instances from our own experience, in which, as a result of the police inquiries into the circumstances attending deaths of a more or less sudden nature, and even in the opinion of doctors called in to attend such patients, no unnatural cause was suspected, and yet, on making a post-mortem examination, we have found poisoning by oxalic, hydrocyanic, or carbolic acid. In these cases it was impossible to tell the cause of death from an inspection of the body or of its surroundings, and only an autopsy could disclose this.

If such unsuspected cases can occur in a large town with a superabundance of well-educated doctors, and in connection with poisons such as arsenic, carbolic acid, oxalic acid, and prussic acid, it is not difficult to imagine that there must be annually a considerable number of others throughout the country.

In the first case, that of J. M., neither the amount of arsenic taken nor the time of its administration can be determined. As a rule, however, a threepenny packet of rat poison contains about 7·77 grms. of arsenious acid, and it is probable that this was the quantity taken. It is not likely that he took the poison before supper at 9 P.M., owing to the absence of any marked symptoms, but it is quite possible that he may have swallowed it at any time thereafter, since with a full stomach the effects of the poison would naturally be retarded.

This patient lived for twenty-seven hours after the onset of symptoms, during almost the whole of which time he is stated to have been frequently vomiting and retching. It is quite in accordance with the well-known inefficacy of vomiting to get rid of all the arsenic taken in a solid form, that the contents of the stomach were found to contain a considerable quantity of the poison, although the vomiting had effectually got rid of every trace of soot. A somewhat unusual circumstance was the entire absence of diarrhœa during the whole period of illness.

The second case, that of R. J., was remarkable for the absence of well-marked symptoms of gastro-intestinal irritation. There was retching, it is true, but he never vomited, while the bowels only moved three times. This appears to have been one of those cases in which the symptoms were partly those of the gastro-intestinal and partly of the paralytic type. This fact, together with the rapidly fatal course of the illness, about seven to eight hours, if we assume, as I think we may, that the poison was taken after supper, would point to a large amount of arsenic having been swallowed. But, on the other hand, we think it is very unlikely that any large quantity was taken, because, notwithstanding that there was no vomiting, the amount of arsenic present in the stomach and intestines was not very great, or in such quantity as is usually associated with the paralytic type of symptoms.

The widespread distribution of the arsenic throughout the various organs in such a short time would be a point of some importance were we not dealing here with the probability of the deceased having frequently taken arsenic previously. How often and how much he was thus in the habit of taking is a matter of conjecture, and it is an interesting problem how he escaped poisoning himself, if, as he is recorded to have said, he took a "pinch" at a time. Taylor states[1] that the question of how much a pinch of arsenic amounted to arose at the trial of Thomas Jennings for the murder of his infant son, Eleazar Jennings, by the administration of arsenic. Actual experiment, Taylor says, shows that a "good pinch" of the powder was equal to 17 grs. It is, of course, beyond belief that a pinch in the present case could have approached this amount on any occasion prior to the fatal one, since 2 or 3 grains would certainly have produced severe symptoms of poisoning, from which, except on possibly one occasion, he does not appear ever to have suffered. It may reasonably be surmised, therefore, that his "pinches" were minute, except upon the last and fatal occasion, and if we assume that the case was one of accident, and that Taylor's computation is correct, then the amount taken did not exceed, in all probability, 17 grains.

The possibility, in this case, that we have to deal with chronic administration of arsenic, detracts from the value which might have been attached to the finding of arsenic so generally diffused throughout the organs after such a short illness, and also from the conclusions which might otherwise have been drawn from the distribution of the arsenic in various parts of the liver.

A feature of interest was the presence of the sulphide of arsenic in both cases in the stomach and intestines. The presence of yellow sulphide of arsenic in the bodies of persons who have been poisoned with arsenious acid, and which have been buried for some time, is not by any means an uncommon occurrence.

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[1] *Guy's Hosp. Rep.*, London, 1845, vol. iii. p. 187.

Orfila records a case[1] of a body exhumed one month after burial, in which there was a yellow spot on the cardiac end of the stomach externally, corresponding to a similar spot on its inner surface. The stomach, duodenum, and jejunum were lined with a yellowish mucus, and a great abundance of particles of white arsenic was found where this yellowish mucus was most abundant.

Christison in 1827,[2] in the body of Margaret Warden, poisoned by arsenious acid, and exhumed twenty-two days after death, states: "The stomach contained 10 or 12 oz. of a thick fluid with yellow particles floating in it." Similar particles were adherent to the villous coat, and at some points were deeply embedded in its substance. Besides the yellow particles, a white powder was scattered over the whole stomach and small intestines.

In this case Christison was closely questioned in his cross-examination as to how the presence of the sulphide of arsenic in the stomach might be accounted for. It was suggested for the defence that the case was one of suicide, and that the deceased might have taken sulphide of arsenic, whereas the prisoner was proved only to have purchased the oxide of arsenic. Christison imputed the yellow particles to conversion of part of the oxide of arsenic into the sulphide by H_2S disengaged in the stomach. Dr. Fyfe, for the defence, stated that he did not conceive this to be a probable explanation, and Christison had to admit that H_2S had never been found, or rather sought for, in the stomach after death, although it had often been found in the stomachs of animals.

The case of Margaret Mackisser[3] set this question at rest in the following year, for Christison again found shiny yellow particles on the surface of the stomach. Instructed by experience, he did not leave the existence of H_2S to be presumed from analogy, but actually detected it in the bottle in which the stomach was sent for analysis. The writer of the article makes the further statement, which is of considerable interest, that the presence of the sulphide "appears in fact to be by no means an uncommon appearance in the stomach." It was remarked in another of Christison's cases.[4]

Christison, in his book on "Poisons," 1829, p. 257, remarks that "the appearance does not seem to have attracted much attention: yet I should think it must occur frequently." Numerous cases have been recorded by many observers in later years, and we can therefore agree with Christison that the appearance is by no means an uncommon one in the exhumed bodies of persons who have been poisoned with oxide of arsenic.

[1] *Arch. gén. de méd.*, Paris, 1823. vol. ii. p. 58 (*Edin. Med. Journ.*, vol. xxi. p. 238).

[2] *Edin. Med. Journ.*, vol. xxvii. p. 453.

[3] *Ibid.*, vol. xxix. p. 415.

[4] *Edin. Med. Chir. Trans.*, vol. ii. p. 284.

Not only may the yellow sulphide thus be formed on the surface of particles of the oxide clinging to the mucous membrane of the stomach and intestines and suspended in their contents,[1] but it may also be found deposited in the tissues, which it has reached by inhibition, as for example under the peritoneum of the stomach and intestines, and in neighbouring organs, giving rise to an appearance as if they had been smeared with yellow paint.

In the case of Alice Hewitt, recorded by Taylor,[2] when the body was exhumed eleven weeks after burial, the arsenic had been partially converted into sulphide, "and it was observed that the liver, omentum, and right side of the heart were thickly coated with yellow arsenious sulphide."

Taylor also records a case [3] in which, in addition to the stomach and intestines, the muscles and ligaments in front of the spine and the mesentery were tinged with a bright yellow colour, due to sulphide of arsenic.

Murray [4] records the case of an Indian woman whose dead body was discovered in a box. "Decomposition was fairly advanced, but there was very little odour." Internally it was fresh and well preserved. "The heart was soft from post-mortem changes, and empty. The endocardium of the left ventricle presented a peculiar bright yellow stain or deposit over one-third of its area, as if iodoform had been powdered upon it." In this case it is stated that a packet of "yellow" arsenic was found in the guilty party's house, but it seems by no means proved that this was the form of arsenic administered, and not white arsenic.

Bose,[5] who received the organs after some days for chemical analysis, states that when he examined the heart he found that the endocardium of the right ventricle also showed a similar yellow colour, and suggests that the formation of the sulphide here may have occurred during the interval which elapsed between Murray's examination and his own. He made experiments by poisoning animals with arsenic, and then treating the endocardium of the ventricles with H_2S, but without positive results.

It is interesting to note that the conversion of antimony into its sulphide has also been observed in exhumed bodies.

In the case of R. *v.* Klosowski or Chapman (C.C.C., March 1903), Sir Thomas Stevenson informs me that in the body of Bessie Chapman, exhumed twenty-two months after death, he found shiny orange-yellow mucus in the lower part of the ileum. In another of the victims, Mary Chapman or Spink, exhumed five years after death, there was orange-yellow discoloration in the lower part of the ileum and first part of the ascending colon. The appearances did not resemble those due to yellow arsenious sulphide, but were like dirty or orange-yellow paint. The presence of the sulphide was proved, and in both cases considerable quantities of antimony were found distributed throughout the various organs of the bodies.

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[1] Guy, "Principles of Forensic Medicine," 3rd ed., p. 448; *Guy's Hosp. Rep.*, London, 1845, vol. iii. p. 187; Taylor, "Poisons," 2nd ed., pp. 193, 375; *Lancet*, London, 1884, vol. i. p. 563.

[2] "Principles and Practice of Medical Jurisprudence," 4th ed., vol. i. p. 285.

[3] *Pharm. Journ.*, 1862, p. 377.

[4] *Lancet*, London, 1892, vol. ii. p. 936.

[5] *Ind. Med. Gaz.*, Calcutta, 1892, p. 142.

In the case of the third victim (Maud Marsh), whose body was examined before burial, no sulphide was observed, but all the organs contained antimony.

The conversion of white arsenic into the sulphide was regarded as a change which only took place during the advanced stages of putrefaction; and although there are numerous cases recorded in which the appearance was observed in bodies exhumed after burial, yet it is a curious fact that there are very few in which the presence of the sulphide has been noticed within a day or two of death.

This circumstance is all the more remarkable when we consider the very large number of recorded cases of arsenical poisoning in which autopsies have been made, and also recall the opinion expressed by Orfila[1] in 1831, that if arsenic were to be taken *en poudre impalpable,* and if H_2S gas were present in the alimentary canal, arsenious acid might be transformed into the yellow sulphide in the course of a few hours.

Hofmann[2] refers to the presence of the sulphide in poisoning by white arsenic within a few days after death as a circumstance which, so far as he is aware, had not previously been observed; and he relates a case in which it was found in the cæcum two days after the person died.

In addition to the two instances which we record, we have only been able to discover in English literature three others in which the presence of the sulphide was observed under similar circumstances, so that the condition must be regarded as one of some rarity.

The following are the three instances to which we refer:—

Letheby[3] relates an interesting case of a girl, æt. 19, who took only 2½ grs. of arsenious oxide. She died in thirty-six hours. The post-mortem examination was made twenty-one hours after death. Along the pylorus the mucous membrane had acquired a gamboge tint, and Letheby remarks on the circumstance that the sulphide should have been found so soon after death.

Taylor[4] records a case in which a man took a large amount of oxide of arsenic. He died eighty-one hours afterwards. There was very little vomiting and no purging. An autopsy was made twenty-one hours after death. "The stomach was distended with gas. The mucous membrane of the left half of the stomach was of a canary-yellow colour, and there was a patch of a similar colour near the pylorus."

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[1] "Traité de médecine légale," 1836, tome iii. p. 174.

[2] *Wien. med. Wchnschr.*, 1886, Nos. 10–12.

[3] *Lancet*, London, 1847, vol. i. p. 44.

[4] *Guy's Hosp. Rep.*, London, 1851, vol. vii. p. 187.

Paterson[1] mentions a case in which he made an autopsy on the day following death. The patient took arsenious acid suicidally, and lived for sixty hours, with symptoms of violent vomiting and purging. "The stomach contained several ounces of a brownish-tinted fluid, with dark-coloured stringy mucus and yellowish particles floating in it. On the surface of the lining membrane was a considerable quantity of this yellowish powdery substance. The yellowish powder, when collected and tested, turned out to be arsenious acid tinged with the sulphuret of arsenic."

Hofmann, in his case, found in the cæcum light yellow particles with citron-yellow coloration of the mucous membrane, and he suggests the possibility of the formation of the sulphide having taken place during life. He does not regard this as likely to occur during life in the stomach or small intestine, except in special circumstances, such as the administration shortly before death of an alkaline sulphide as an antidote, as Christison[2] had in the year 1827 pointed out. In the large intestine, however, Hofmann thinks it is quite possible for the change to take place, because H_2S occurs in the gases of the large intestine, and, as a rule, the contents of this part of the bowel have an acid reaction. Whether this change can, under certain circumstances, occur during life or not, there is no doubt that the conditions present in a body within a few hours after death may be highly favourable to the process of converting arsenic into the sulphide. In the cases cited above, as well as in the two we record, the stomach is described as distended with gas, or the organs otherwise showed evidence of putrefaction, so that there is little difficulty in ascribing the condition to a post-mortem change.

This early conversion of arsenious oxide into the sulphide in the stomach and small intestines is a matter which is of considerable medico-legal importance. If the fact had not been thus placed beyond doubt, it is not improbable that such exceedingly quick and extensive conversion of arsenic in the body into the sulphide might be regarded as impossible, and a guilty person be wrongly accused of administering orpiment, whereas white arsenic had been the poison employed. In the majority of cases, however, it will be found that, in addition to the sulphide, white arsenic is also present, a fact which proves that the poison must have been administered in this latter form. This circumstance was noted in all of the above cases, and it will be further found, as a rule, that the particles which appear yellow are only so on the surface, and contain a core of arsenious oxide.

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[1] *Edin. Med. Journ.*, 1858, vol. iii. p. 394.

[2] *Ibid.*, vol. xxvii. p. 453.

The conversion of arsenic into the sulphide has further medico-legal importance, inasmuch as, owing to its insolubility in water and acid fluids, it cannot become disseminated from organs in which it has once been formed, by processes of imbibition and transudation after death, like the more soluble arsenious acid.

It must be borne in mind that a yellow coloured particle or a yellow staining of the mucous membrane may be due in cases of arsenical poisoning to other causes.

Taylor[1] found a white crystalline powder mixed with yellow particles in the stomach eight days after death in a case of poisoning by arsenic. At first he thought they were particles of arsenious acid mixed with the sulphide, but on further investigation the white powder was found to be compound phosphate of ammonium and magnesium, while the yellow particles consisted of organic matter.

Whitford[2] found a bright yellow staining of the bowel and of the mesenteric blood vessels in a child, æt. 10, whose body was exhumed twenty-one months after death. The bowel contained small hard granules, which proved to be phosphatic crystals. One grain of arsenic was obtained from the abdominal viscera.

In a second case, that of a man, æt. 24, whose body was exhumed after three years' burial, he also observed yellowish stains on the grave clothes; the intestines presented throughout most of their length a golden yellow staining, and the mesenteric vessels were similarly stained. Small phosphatic crystals were present as in the previous case. On analysis, 3¼ grs. of arsenic were extracted from the abdominal viscera.

Brown and Davies,[3] who analysed the yellow pigment in these cases, found that it was not sulphide of arsenic, but in all probability was due to bile pigment.

These observations show that in cases of arsenical poisoning, in which yellow stains or particles are observed, the presence of sulphide of arsenic must not be assumed, but must be proved by chemical tests. This was done in our own cases, although the distribution and appearance of the yellow stains were such that they could not be confounded with the effects of bile by anyone who was experienced in the examination of bodies after death.

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[1] *Guy's Hosp. Rep.*, London, 1851, vol. vii. p. 222.
[2] *Lancet*, London, 1884, vol. i. p. 419.
[3] *Ibid.*, p. 421.

THE PATHOLOGY OF PAROXYSMAL HÆMOGLOBINURIA (PRELIMINARY COMMUNICATION).[1]

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(Plate I.)

Since Dressler published the first satisfactory description of a case of paroxysmal albuminuria and chromaturia in 1854, the pathology of this disease—now known by the more appropriate name, paroxysmal hæmoglobinuria—has had devoted to it a very considerable amount of investigation, which, however, has not given results sufficing to explain its pathology. The literature of paroxysmal hæmoglobinuria is very copious, and the theories regarding its pathology have been so numerous and varied that it would now require considerable space to give a complete synopsis of them. Many of these theories are speculative opinions of little or no value.

The present research is indeed not intended to be a complete historical account of already published writings, although many of those which are of permanent value must necessarily be alluded to whenever consideration of the pathology of the disease is entered upon. My chief object is to describe certain experiments which I have been enabled to conduct by the methods of research introduced in quite recent years by Ehrlich and Morgenroth.

Since the publication of Chvostek's monograph a new epoch in medical science has begun with the work of Bordet and Ehrlich on immunity, and the initiation of the present research was due to the general knowledge I possessed of those famous investigations. It occurred to me that the clinical features of paroxysmal hæmoglobinuria were such that an investigation of the disease by the methods of Ehrlich was required; and the most careful consideration that I gave to all the circumstances of the disease encouraged me to form the opinion that the pathology of paroxysmal hæmoglobinuria would ultimately be explained by the information thus obtained.

I began in 1903 with the working theory that we have probably to deal with a hæmolysin which might or might not be composed of two active substances, amboceptor[2] and complement.[3]

The following possibilities occurred to me regarding the supposed blood toxin:—

It might be—(1) A toxin whose usual habitat was not the blood, but whose passage into the blood was determined by such factors as cold on the surface of the body, or muscular exertion. (2) A toxin whose development in the blood was promoted by such factors. (3) A potential toxin which acted only under the influence of such factors. (4) A combination of two or more of these.

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[1] Part of a thesis for the degree of M.D., and which was awarded a gold medal. Read before the Galenian Society, January 1904.

[2] Intermediary body, fixateur, etc.

[3] Alexin, etc.

The theory that this disease is consequent on the presence of a toxic substance in the blood, was first suggested by Wiltshire in 1870, and in the time that has elapsed occasional opinions have been expressed in support of such a theory. Wiltshire's view was, that the "disintegrating agent" was a volatile organic acid, probably a fatty acid which was thrown back into the system by chilling of the skin, and thereby "autogenetic poisoning" occurred.

Ilguer considered it an infectious disease. His patient had malaria previously. Ehrlich's original view was that a proportion of the red cells were hypersensitive to the action of cold. He maintained that this was proved by ligaturing and immersing a finger in ice-cold water for a quarter of an hour and then in tepid water for a quarter of an hour. The serum was then hæmoglobinæmic. In a later publication he found he could not confirm this *in vivo* experiment by a somewhat similar one *in vitro.*

He then concluded that the blood vessel endothelium under the influence of cold, produces substances (ferment) which destroy the corpuscles.

Charpentier thought that under the influence of cold combined with malarial infection there was produced a toxin which could disintegrate the corpuscles directly or by indirect action through the vasomotor centre. His views were not supported by any experimental investigation.

Prior investigated the literature and conducted much work, to which reference will be made later. He formed the opinion that a toxic substance originates in the alimentary canal and passes into the blood circulation. Such a view has some resemblance to that of Hunter in the case of pernicious anæmia. Chvostek considers the formation of toxic material by the vessel endothelium at least improbable, because destruction of corpuscles takes place *in vitro* by shaking.[1] An abnormal property of the serum cannot be demonstrated.

Hayem in 1889 indicated that there was probably a toxæmic condition of the blood in this disease. He has recently given his views on this subject in his published lectures. The paroxysm is considered to be due to a toxæmia in individuals affected with a chronic alteration of the blood. Assuming this change in the blood, he considers that the paroxysm can then be determined by causes which increase the waste products circulating in the blood, such as cold and fatigue. He refers to the syphilitic origin of many of the cases, and believes that this accounts for the blood in these cases being rendered vulnerable, just as in paludism the blood is rendered vulnerable to quinine. In the absence of syphilis the corpuscles may be rendered vulnerable by other causes, such as gastritis of alcoholic origin which was present in one of his cases.

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[1] *Loc. cit.*, p. 65.

In short, his view is that cold or fatigue produce toxic substances which, while they do not cause the destruction of normal cells, are yet sufficient to destroy the more vulnerable cells of individuals predisposed by a certain toxæmic state of the blood. His chief reason for accepting a toxic origin is the presence of methæmoglobin in the urine, and he considers the corpuscle destruction takes place in the kidney, where alone the toxic substances would be present in sufficient concentration to produce this change.

Luzzatti and Sorgente think that the blood serum during the paroxysm has a hæmolytic action. The serum of the interval has no abnormal or strong hæmolytic action, but the serum of the stasis blood produces quick hæmolysis unless the part affected by stasis is kept warm. If the ligatured limb is kept warm, the serum separated from the blood is much clearer than if the unligatured limb is subjected to chilling before taking away blood. This experiment minimises the intrinsic importance attributed to the action of stasis by Chvostek.

Luzzatti and Sorgente, agreeing with Hayem, believe that serum which separates, coloured by hæmoglobin, has no further hæmolytic action. After the paroxysm the serum resumes its normal conserving power. Contrary to the view of Hayem, they believe that destruction takes place in the peripheral vessels and not in the internal organs as a rule. They do not deny that there may occasionally be cases of renal origin. Blood obtained from their patient in the interval gave up a clear serum—(*a*) After coagulation at the room temperature or on ice, (*b*) by centrifuging. But if the temperature was changed from that of ice to 37° C., a rose-red serum was sometimes obtained. To this they attached no importance, as by the same means a coloured serum was obtained from the blood of healthy children. After many experiments *in vivo* and *in vitro*, they concluded that cold produces certain changes within the organism which cannot be produced by this agent *in vitro*.

In regard to the toxic theory of paroxysmal hæmoglobinuria, the foregoing opinions are those which had already been published when an opportunity presented itself to me to study two cases of this disease which came under my observation at the out-patient department of Leith Hospital.

After full consideration of the chief features of the disease, and keeping in view certain facts and ideas regarding malaria and pernicious anæmia, I became eager to know if in the case of paroxysmal hæmoglobinuria we had to do with the action of a hæmolytic body, and if so, then to ascertain if this body produced its action in the same way as Ehrlich and Morgenroth have maintained for the immune sera, namely, by means of amboceptor and complement.

Technique.—This varied to an extent which will be defined as I proceed with the description of the various experiments. At first it was desirable to ascertain by the simplest methods if there were sufficient reasons for proceeding with a lengthy investigation, in which the more elaborate experimental technique of Ehrlich could be employed.

On that account the plan of using serum obtained from cantharides blisters appeared worthy of trial. There was the advantage, moreover, that a large amount of serum could thus be readily obtained. From a blister 2½ in. square, 10 c.c. of serum are usually available. Previous to the application of the cantharides plaster, the skin was carefully cleansed with lysol and water, then with methylated spirit, and finally with boiled water. Before opening the blister, its surface was again very carefully washed with boiled water. A Graefe knife and scissors were sterilised in boiling water, and a test tube was washed, dried, and plugged with wool, and finally kept in an oven for two hours at 160° C. A small puncture was then made in the most dependent part of the blister, and the serum was received directly into the tube, which was again closed with the sterile plug. I thus obtained in a very simple way a large amount of serum. In order to test the toxic properties of the serum on corpuscles of the same or another individual, the manipulation was again simple, and therefore conducive to asepticity. One c.c. of the serum was drawn up into a sterilised pipette, and was then received into a test tube already sterilised. A finger of the individual who was to supply the blood was carefully cleansed with lysol solution, and then with boiled water, and dried with wool. A surgical needle sterilised in boiling water was used to prick the finger, and three drops of blood were allowed to fall into the serum. The woollen plug, sterilised with the tube, was then replaced, and the serum and blood were gently shaken. In the earlier experiments the tubes were allowed to stand at the room temperature for twenty-four hours. It will be noted that the whole blood was used (not corpuscles which were separated and washed from the serum). Several very careful workers have likewise used whole blood, as for instance Polk, in a recent research on the heterolytic action of human serum on rabbits' blood. Polk considered his results in no way vitiated by doing so. This technique was also quite satisfactory for my preliminary experiments.

In July 1903, the patient, T. S., was in hospital, and had many paroxysms. He was certain to have a paroxysm if he remained up out of bed for an hour or two.

On 10th August, T. S. was allowed up for two hours. He began to shiver, and the characteristic symptoms of a paroxysm followed. A blister was applied to the abdomen, and the serum was obtained on the following day (serum A). Serum was also obtained from a man who had just recovered from acute rheumatism (serum B), and a girl suffering from nephritis (serum C). (1) Blood was obtained from the man who gave serum B; (2) blood was obtained from resident physician; (3) blood was obtained from myself.

1 c.c. Serum A + Blood 1, three drops	Serum had a deep carmine colour.
1 „ „ A + „ 2, „	
1 „ „ A + „ 3, „	
1 „ „ B + „ 3, „	Serum remained very pale.
1 „ „ C + „ 3, „	Serum very slightly tinted.

The clot which formed in the tubes varied thus—

Blood mixed with serum C gave a "tough and heavy" clot.
„ „ „ B „ "dense and heavy" clot.
„ „ „ A „ "much less dense clot than in B and C.

Microscopical examination of the corpuscles after ninety minutes in the tube disclosed variation in the size of the cells acted on by serum A. There was no tendency to rouleaux formation. After twenty-four hours there was considerable variation in the size of the cells. The small cells were much crenated and deeply coloured. Other cells were large and pale.

With the microscope, the serum could also be observed to have a deeper colour. Cells acted on by serum B were grouped together after ninety minutes. Variation in size also present. After twenty-four hours, the cells, besides showing grouping, were almost without exception small, and their colour was uniformly deep. Not much crenation.

Serum A, therefore, appeared to have the property of injuriously acting on the red cells, and also that of modifying the fibrin formation. This serum could not accurately be called the serum of a paroxysm, as the blister was only applied five hours after symptoms began, and the serum was not obtained till the following day.

Similar experiments were done on 12th August, and again on 16th August, when there could be no doubt that it was *interval* serum. The former results were confirmed.

August 23.—In order that the serum of the *paroxysmal* period might be tested, I availed myself of the patient's predisposition to paroxysms if allowed out of bed.

Accordingly, a blister was applied at 5 A.M., and the patient was allowed out of bed at 10 A.M. At 2.45 P.M. he began to be shivery. At 3.15 P.M. he passed dark urine containing hæmoglobin. Meantime the blister had been forming, and was likewise evacuated at 3.15 P.M. The serum was golden in colour, and a spectroscopic examination showed the bands of oxy-hæmoglobin. There was, however, so little hæmoglobin present that the naked-eye appearance did not suggest its presence. There was absolutely no reddish tint. The following experiments were done:—

1. 1 c.c. normal serum + normal blood, three drops. No hæmolysis.
2. 1 „ „ „ + P.H. „ of interval. No hæmolysis.
3. 1 „ P.H. „ + normal „ three drops. Hæmolysis.
4. 1 „ P.H. „ + P.H. „ of interval. Great hæmolysis.

Evidently, the serum of the paroxysm had a similar action to that of the interval. On this occasion the mixtures were shaken up somewhat violently, and therefore the negative result in 2 speaks strongly against Chvostek's theory.

Chvostek observed that the serum became hæmoglobinæmic if the blood of his patient was put in a centrifuge which did not move smoothly, and the same occurred in the serum of blood obtained by wet cupping. These observations led him to conclude that the corpuscles were very susceptible to mechanical injury, and that hæmoglobinæmia resulted from this cause. My last experiments indicate that Chvostek's theory is at least not an entirely satisfactory one. The corpuscles in tube 2 withstood a considerable degree of violent shaking.

Donath has recently reported on the resisting power of the red cells in this disease after a careful investigation, and he has found that the corpuscles of paroxysmal hæmoglobinuria blood were always less resisting (in three cases) than those of normal blood. Full consideration of this aspect of the subject is meantime reserved. The results I have recorded, however, distinctly indicate that there is some other explanation of the hæmolysis than that of Chvostek. I hope to show that Donath's results are not inconsistent with my view. I am, moreover, convinced from the experiments on 10th, 12th, and 16th August that mechanical injury is by no means a necessary condition for the occurrence of hæmolysis.

The method of using blisters to test the serum of the paroxysmal period was very satisfactory, as blood serum obtained at this period is generally so much coloured that reliable results cannot be easily obtained.

The following microscopical examination was made :—

A drop of T. S.'s serum was placed on a glass slide (1) along with a drop of normal blood, and a cover-slip was then applied. A similar preparation (2) was made with the control serum, which in the last tube experiment was found to possess no hæmolytic action on normal blood. The two slides were then laid on a sheet of moistened blotting paper, which was placed under a bell jar for one hour. The following characteristics were then noted on microscopical examination :—

Slide 1. (1) No rouleaux formation.
,, (2) Variation in size of cells.
,, (3) Poikilocytosis fairly marked. The cells assuming a lenticular shape.
,, (4) There also appeared to be a change in the condition of the pigment, which now appeared pink.
,, (5) Practically no crenation.
Slide 2. (1) General formation of rouleaux.
,, (2) No variation in the size of cells.
,, (3) No poikilocytosis.
,, (4) No pink appearance of cells.
,, (5) Crenation distinct.

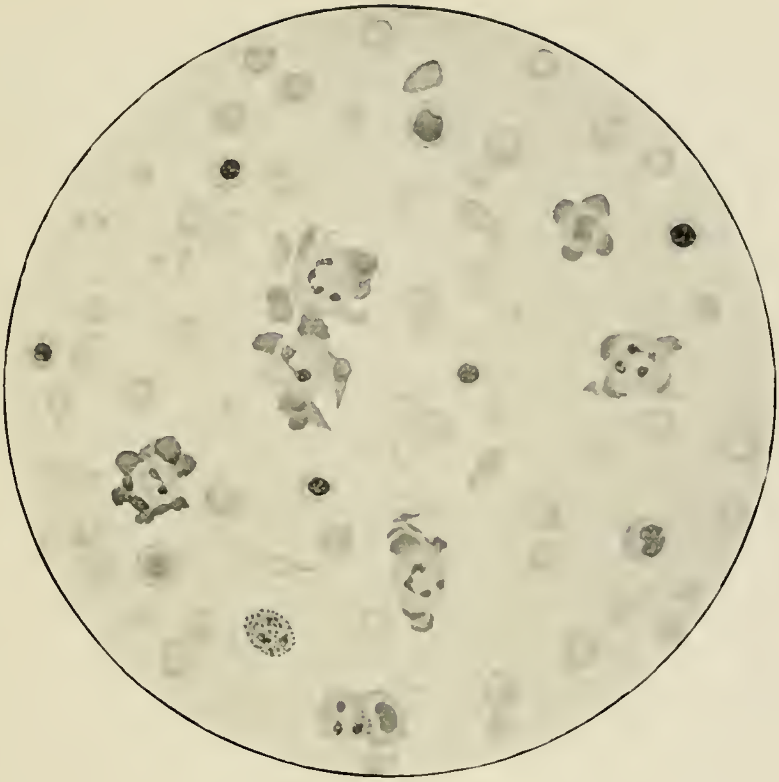

Fig. 1.

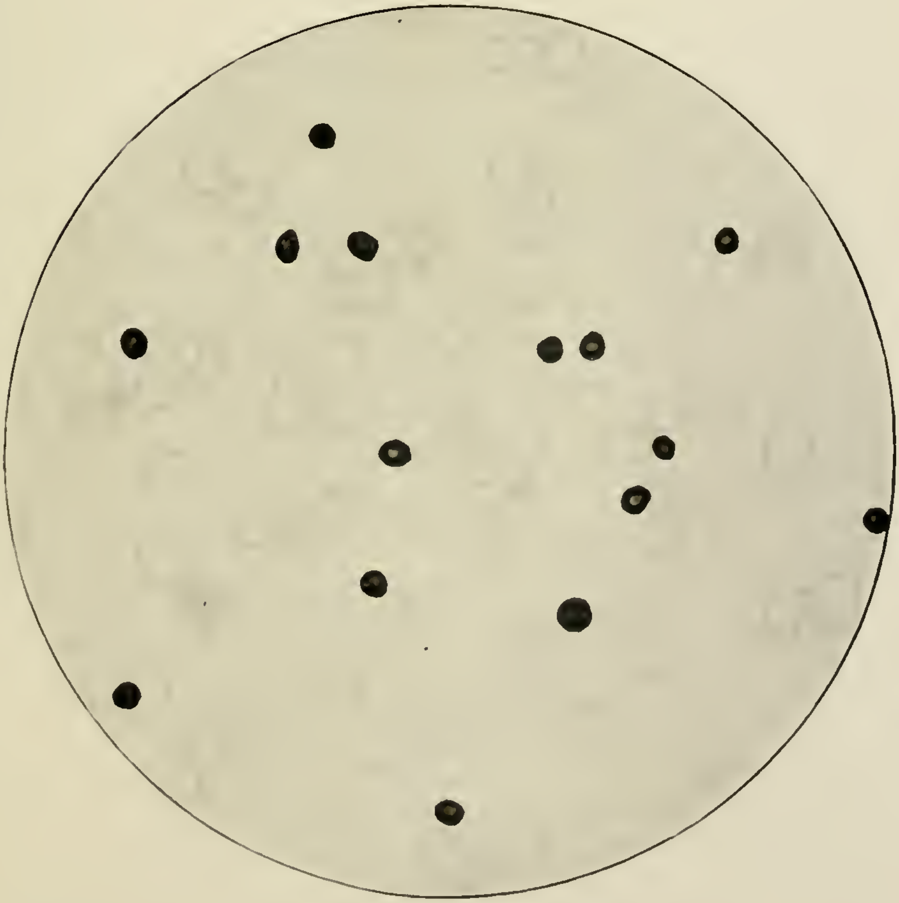

Fig. 2.

On 30th August (during a paroxysm), blister serum was again obtained, and its hæmolytic action on normal blood corpuscles (my own) was again noted. A careful microscopical examination of the cells was made after the tube had been allowed to stand for sixty minutes at the room temperature. Their condition is fairly well indicated in Plate I., Figs. 1 and 2. Already after sixty minutes many changes have become evident in the cells. In the size and colour of the red cells there is considerable variation, while some may be considered normal in these respects. There are many large cells which are very pale, and there are others which have become contracted, and possess a uniform supernormal colour. Changes in the condition of the hæmoglobin within the cells are also present. In numerous cells globules of dissolved hæmoglobin may be seen dotted throughout the cell. Some of these globules I have seen lying free in the serum, apparently so recently extruded from the cell that sufficient time had not elapsed in order to permit an intimate mixture of the hæmoglobin with the serum.

I wish to emphasise that the above description refers to the action of paroxysmal hæmoglobinuria serum on normal cells (isolysis) which were originally of uniform size.

I also made a most interesting observation which jointly concerns the leucocytes and erythrocytes. I attach considerable importance to the observation, for reasons which I will now submit.

Levaditi, by his investigations in the domain of immunity, was one of the foremost to draw attention to the extraordinary activity with which phagocytes attack red cells which have become loaded with intermediary body. He found that the red cells when in this condition are very eagerly absorbed by the phagocytes, in whose interior solution then occurs. This appears to be an extreme degree of the process already observed by Metchnikoff.

Savtchenko has made the same observation as Levaditi.

Gruber conducted many experiments to test this and other observations made by Levaditi. He entirely agrees with Levaditi in maintaining "that erythrocytes, which contain intermediary body, undergo phagocytosis much more quickly and in much greater number than do normal erythrocytes."

Ruziczka has also noted this extraordinary phagocytic attack on the red corpuscles in the presence of intermediary body.

Ruziczka immunised guinea-pigs to fowls' blood, and then, after immunisation, the fate of the blood corpuscles of later intraperitoneal injections was ascertained (after some time had elapsed), by obtaining some peritoneal contents by means of a capillary tube. He observed that the microphages and macrophages are able to destroy the red corpuscles without previously absorbing them, but by fixing themselves to the red cells, and gnawing and digesting them away bit by bit, apparently by the action of a digesting juice.

Those corpuscles which are thus nibbled away do not swell up (as when destroyed free in the serum by the complement), nor do they lose their hæmoglobin, but retain it to the last, and indeed possess a more intense colour than the intact corpuscles. This process can be followed beautifully *in vitro.*

The above description is a literal translation from Gruber, who has completely satisfied himself of the accuracy of Ruziczka's observation.[1]

I have said that in the microscopical examination of normal human blood which had been exposed to the action of paroxysmal hæmoglobinuric serum, I had made an observation which concerned jointly the leucocytes and erythrocytes. It was this phenomenon described by Ruziczka and Gruber to which I referred, and the reason I deemed my observation of importance was that which I have just stated, namely, that Levaditi, Savtchenko, Gruber, and Ruziczka are agreed that such unusual eagerness of the phagocytes is the result of the activities of intermediary body on the red corpuscles.

The deeper colour possessed by those red cells which are attached to the leucocytes is shown in Plate I., Fig. 1. It may also be seen that those attached cells have not become enlarged.

In many cases also the red cells appear to be partly nibbled away. The significance which I attach to those changes which I have observed in the red and white cells is that we have probably to do with the activities of an intermediary body in the serum of individuals affected with paroxysmal hæmoglobinuria.

A series of experiments was thereafter done with the object of determining the effect of temperature on the process of hæmolysis, by paroxysmal hæmoglobinuric serum. The result of these experiments was that all preparations which were kept at the blood temperature showed no sign of hæmolysis, while, as before, those which were allowed to stand for some time at the room temperature showed distinct hæmolysis. Meantime, I reserve the detailed description of these experiments.

Control experiments.—Control blister serum experiments were also done in such diseases as rheumatism, epilepsy, tuberculosis, myxœdema, pleurisy, pneumonia, cancer, rheumatoid arthritis, etc., as well as with serum obtained from many apparently healthy individuals. In almost all cases no hæmolysis occurred, and never with serum from those having good health. In the very few instances in which hæmolysis occurred, it was *always less pronounced than that produced by paroxysmal hæmoglobinuric serum.* I hope to give further data at another time to indicate the diseases in which the serum may have hæmolytic properties.

Blood serum experiments with paroxysmal hæmoglobinuria serum gave similar results to those already indicated in the case of blister serum. The same conditions of temperature were required for hæmolysis.

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[1] Ruziczka's work is published in the Bohemian language.

The following experiment may be quoted as being a further help to understanding the mode of action of the toxin:—

November 12.—Blood serum obtained from the patient, M. R., during interval. Under aseptic precautions, blood was obtained from a vein of the arm, by means of an exploring syringe. The blood was allowed to coagulate in the syringe, and when the serum had separated it was drawn up by means of a fine pipette. The serum was clear and yellow.

The serum was diluted with an equal part of 0·5 per cent. NaCl solution in order to have a workable quantity of fluid. One-half of this was inactivated by keeping it at 56° C. for an hour.

1. 0·75 c.c. active serum + 0·75 c.c. 5 per cent. mixture of normal washed red blood corpuscles in 0·5 per cent. NaCl solution. Distinct hæmolysis in three hours.
2. 0·75 c.c. inactivated serum + 0·75 c.c. 5 per cent. mixture of normal washed red blood corpuscles in 0·5 per cent. NaCl solution. No hæmolysis.

The tubes were exposed to the room temperature for three-quarters of an hour before being placed in the incubator at 37° C.

Hitherto I had rarely obtained hæmolysis as quickly and, in the course of three hours, never in such a pronounced degree. The negative result obtained in tube 2 was a corroboration of my supposition that the hæmolysis was effected by means of intermediary body and complement.

I have already indicated my reason for supposing that an intermediary body was present in the serum. This is a thermo-stabile substance, as Ehrlich and many subsequent writers have demonstrated. It remains uninjured by exposure for half an hour to a temperature of 56° C.

I expected, however, to be able to prevent hæmolysis by rendering inactive a second substance, namely, the complement or thermo-labile component of the hæmolysin. The result as shown by 2 agreed with my anticipation.

Although a slightly hypotonic salt solution was used in the above experiment, the positive result in (1) is not invalidated thereby, for the reason that hæmolysis of normal corpuscles, so prepared, has not occurred within three hours in my experience, nor was there hæmolysis in (2).

This concludes the brief outline of a series of experiments performed during 1903, and on consideration of the results which were obtained I was enabled to arrive at the following conclusions:—

1. A pathological substance is present in the blood serum and lymph of individuals affected with paroxysmal hæmoglobinuria.
2. This substance can dissolve (*in vitro*) the corpuscles of the affected individual (autolysis) and also those of normal individuals (isolysis), provided suitable conditions as to temperature exist.
3. Temperature conditions require to be further studied; it is, however, apparent that a temperature much below that of the

body favours the action of the hæmolytic substance, while the normal body temperature retards or prevents it.

4. My observations regarding phagocyte activity during the hæmolysis (*in vitro*) correspond with those made by Levaditi, Savtchenko, Gruber, and Ruziczka, in their comparative work on immunity.

5. These authors consider that the excessive phagocytic action, observed by them, is significant of the antecedent union of intermediary body with the red corpuscles. "The Ruziczka phenomenon" is constantly observed during the autolysis and isolysis of red corpuscles produced by the serum of paroxysmal hæmoglobinuria cases. Therefore the probable explanation of the hæmolysis is the union of intermediary body and red corpuscles.

6. The intermediary body of paroxysmal hæmoglobinuria, however, cannot of itself produce solution of red corpuscles. For this, the presence of a thermo-labile substance complement is also required.

7. The changes observed in the red cells in course of solution correspond with those produced during hæmolysis by an immune serum as described by Gruber.

8. The serum of normal individuals does not cause hæmolysis. The serum of various individuals suffering from disease produced little and generally no hæmolysis.

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NOTES OF FOUR CASES TREATED BY DOYEN'S SERUM.

By Alexis Thomson, M.D., F.R.C.S.Ed., *Assistant Surgeon, Royal Infirmary, and Surgeon to the Deaconess Hospital, Edinburgh.*

In the April number of the Journal I published a résumé of Doyen's views on the etiology and treatment of cancer, and I mentioned that I was engaged in observing certain cases in which his serum was being tested. As these cases are now completed, it seems to me advisable to put them on record. I may mention that one of the patients was seen by Dr. Germain See, Doyen's assistant, and was pronounced by him to be a suitable case for the employment of the serum, while all the cases were seen along with Dr. Barbour Simpson, who carried out the injections on the lines formulated by Doyen.

Case 1 was that of a woman, æt. 57, the subject of an extensive recurrence after an operation for scirrhus carcinoma of the mamma. I had removed the breast and axillary contents seven months before, and two months later I had resected the clavicle and removed a large mass of glands from the posterior triangle. She now presented a combination of cancerous infiltration and of nodules in the vicinity of the axillary segment of the scar resulting from the first operation, and a diffuse solid œdema of the entire upper extremity of the same side. She suffered a great deal of pain, particularly in relation to the arm, but her health appeared good, and there was no evidence of any visceral dissemination of the disease. Her condition was obviously a hopeless one, and it was on this basis that the treatment by Doyen's serum was proposed and accepted.

The injections were commenced on 21st February, and repeated on the 24th and 27th, and on the 2nd, 5th, 9th, 11th, 13th, 16th, and 20th of March. On several occasions there was a decided reaction, the temperature rising to 103° F. There did not ensue any improvement either in the local or general condition; the cancerous nodules in the skin increased in size and number so as to become almost confluent, the general health deteriorated, and the pain in the axilla and arm was so severe as to call for frequent injections of morphine. At her urgent request I disarticulated the arm at the shoulder, and removed the infected skin over the chest on the 20th March. Injections of serum were resumed on the 11th April, and repeated on the 14th, 17th, 20th, and 24th. A cancerous erythema appeared around the wound, and continued to spread. The general health became steadily worse. She was transferred to the Longmore Hospital on the 23rd May, and died there on the 31st May. Cancerous nodules in the skin were examined microscopically before and after the serum treatment, without any alteration in the characters of the tissue elements being discovered. Those who watched throughout the progress of this case were unable to observe any benefit which could be traced to the employment of the serum, and from the patient's point of view this added to the distress and failure of health incident to the disease.

Case 2 was one of recurrent scirrhus carcinoma of the mamma in a woman, æt. 57. The body of the breast, including a tumour, had been removed by Dr. Soutar of Montrose three and a half years before. The recurrent disease assumed the form of an ulcerating tumour below the scar of the former operation, together with three outlying nodules in the skin and a large mass of indurated glands in the axilla. She was a robust and well-preserved woman, apparently in the enjoyment of perfect health. This case fulfilled the conditions laid down by Doyen for successful treatment by means of his serum: all the visible disease could be removed by operation, and there was no evidence of dissemination of the disease beyond the area of its origin; at the same time, without the aid of the serum, operative interference would almost inevitably be followed by recurrence. The usual course of injections of serum was given before operation; the reactions were moderate, and it was believed that pain was alleviated, and that the ulcer had assumed a healthier appearance. I removed all the visible disease in breast, skin, and axilla on the 9th March. Microscopical examination showed it to be scirrhus carcinoma. She had a further course of injections after the operation, and then went home, apparently in the best of health and without any discoverable trace of malignant disease. Already in May, Dr. Soutar wrote that fresh cancer nodules had made their appearance in the vicinity of the scar, and that a hard lump had been discovered in the opposite breast. The disease progressed very slowly; Dr. Soutar was of opinion that her general health and vigour stood out better than is usually observed in malignant disease of a similar character. Death took place suddenly on the 28th October, seven months after the extensive operation described.

Case 3 was that of a man, æt. 59 (a patient of Dr. Ramsay Sibbald of Stanley), the subject of a truly enormous tumour of the lower jaw, of some two years' progress. It was an unfavourable case for operation, as it was fixed to the mandible and to the overlying skin. The X-ray photograph appeared to show that the maxilla was only implicated in the growth along its inferior border, and this, together with the urgent request of the patient, decided me to attempt its removal. I undertook the operation on the 4th of April. It proved a very severe one, as the jaw was so extensively infiltrated that it broke across, opposite the left canine tooth, and there were a number of infected glands on both sides of the neck. The disease proved to be squamous epithelioma. He made an uneventful recovery, and after a full series of injections he went home early in May. Not long after it was reported that the disease had broken out afresh, and that he was going down hill rapidly.

It may be mentioned that Dr. Barbour Simpson did not expect any benefit from the employment of the serum in this case, as no success had hitherto been recorded in epithelioma of similar extent, situated on the head or neck.

Case 4 will be briefly reported, as it turned out not to be one of malignant disease. It was that of a man, æt. 41, the subject of an ulcerating warty growth involving the penis and scrotum, and said to have been in existence for ten or twelve years. It had shown markedly aggressive characters, causing extensive destruction of the penile and scrotal tissues, while the discharge from its deeply fissured surface was foul to an extreme degree. It differed further from the common venereal papillomata in the extreme friability of its tissue and the readiness with which it bled. The fact that the inguinal lymphatic glands were enlarged but were not hard or fixed was against the disease being epithelioma. A portion of the growth was removed for examination, and although the microscopical diagnosis was papilloma, it was considered advisable to completely extirpate the growth. This was carried out, after the usual preliminary course of injections; the scrotum was found to be filled up with friable papillomatous growth, which on more detailed examination showed no evidence of malignant disease. The patient has since remained quite well, and the enlargement of the inguinal glands has disappeared. It is interesting to note that the reactions which followed the injections of serum in this case were quite as marked as in those of malignant disease recorded above.

It should be pointed out that these cases are recorded not because they of themselves afford any grounds for deciding as to the merit or demerit of Doyen's serum; if added to others, however, they may help to the solution of this question.

The pleasant duty remains of tendering my grateful thanks to Dr. Barbour Simpson for his kind co-operation and assistance.

NOTE ON A CASE OF OSTEOGENESIS IMPERFECTA (IDIOPATHIC OSTEOPSATHYROSIS).

By J. S. Fowler, M.D., F.R.C.P.Ed., *Extra Physician, Royal Hospital for Sick Children, Edinburgh.*

We owe our knowledge of the condition called osteogenesis imperfecta almost entirely to studies of fœtuses, most of which have been still-born, and only a few have survived birth for some hours or days. It has therefore been generally assumed that the condition is incompatible with prolonged life, but I believe that this is not so, and that children suffering from osteogenesis imperfecta may not only survive birth, but reach adult life. Stilling in 1889, and Hildebrandt in 1899, described the disease fully, and their accounts of it practically agree with one another. Its distinguishing features are—(1) Extensive cranio-tabes, the vault of the cranium being sometimes nothing more than a membranous sac; and (2) great brittleness of the bones and multiple fractures, with masses of callus where union has occurred. As the ribs are very frequently broken, spurious beading is often present, and this, associated with the cranio-tabes, seems to be the reason why such cases have erroneously been regarded as true intra-uterine rickets. Apart from the two signs mentioned, there seems to be no other constant one; in some, but not all cases, the limbs are said to have been short, the nose broad and flat, and the body obese. The morbid change is definitely known. It is limited to the diaphyses and bones of the cranial vault, and consists in an abnormally increased size of the primary marrow spaces without equivalent deposit of new bone by osteoblasts. It should be noted that there is no abnormality of ossification either of the base of the skull or of the epiphyses of the long bones. It is thus a complete contrast to achondroplasia. Ballantyne describes fœtal bone diseases as of four types only, of which two appear to be osteogenesis imperfecta and two achondroplasia. If, then, achondroplasia and osteogenesis imperfecta do not between them cover the whole range of diseases of the fœtal skeleton, they are at least by far the most common of these maladies.

Case.—In April 1899 I was asked to see the 4-days' old baby of healthy parents, which had been born naturally at term without assistance. On the morning of my visit a painful swelling of the left thigh had been noticed. The child was a healthy, well-developed infant; the bridge of the nose was perhaps a little broader than usual, but otherwise the baby was well proportioned. The cranium was very imperfectly ossified; the anterior fontanelle measured about four finger-breadths, the coronal, sagittal, and lambdoidal sutures gaped, and the occiput was almost entirely undeveloped. The whole skull was extremely soft and yielding. There was a fracture of the middle of the left thigh, with very evident crepitus. No signs either of rickets or of intra-uterine fractures were present. The cause of the fracture was unknown; no accident was known to have occurred. The fracture was set, and united quickly with the formation of a large mass of callus, and by the time the child was 7 weeks old could scarcely be distinguished. At this date there was hardly any advance in the ossification of the cranium, but by the 14th week the head was very much firmer: the coronal sutures were closed, the posterior fontanelle could just be detected, while the lambdoidal sutures were about ¼ in. wide at their lowest part. At 3½ months old the child fractured his left humerus, at 18 months the left femur, at 21 months the left humerus, at 24 months the left humerus again. During his third year he fractured his right humerus twice—that is, he sustained seven fractures up to the age of three years, since when I have lost sight of him. In all cases the bones were broken as the result of very trifling violence; the fractures were attended by considerable pain, but united well. The child was breast-fed, and dentition began at 6 months. He did not walk until nearly 2 years old—this partly on account of the fractures. He was a year old before the back of his skull was properly ossified, and at the age of 2 the anterior fontanelle measured ¾ in. across. He never showed any sign of rickets. The hands were quite normal in appearance. At 3 years old he was somewhat small for his age, measuring 31 in., as against the average of 35.

The case I have related corresponds exactly with what is called in still-born fœtuses osteogenesis imperfecta. It also agrees closely with idiopathic fragilitas ossium. Crozier Griffith in 1897 collected records of fifty-seven cases of the latter disease, but no one seems at that time to have connected it with osteogenesis imperfecta. The reason for this is, apparently, that the condition of the head at birth has escaped notice, either because the patients did not come under observation early enough, or for some other cause. In none of Griffith's cases is information on this point available. The conclusions to which I have come are—(1) Children suffering from osteogenesis imperfecta may survive; (2) the condition is recognisable clinically by the association of brittleness of the bones and cranio-tabes; (3) osteogenesis imperfecta and idiopathic fragilitas ossium are two names for the same disease.

A question worthy of further inquiry is whether, apart from shortening due to fractures, osteogenesis imperfecta leads to any dwarfing in later life.

Since the above note was written, a paper by Nathan has appeared,[1] in which similar views are expressed, and Hohlfeld[2] describes a case like mine under the title Osteogenesis Imperfecta. The most conclusive evidence of the identity of the two diseases is, however, afforded by Looser's recent study of the morbid anatomy of idiopathic osteopsathyrosis,[3] from which he found that the microscopic appearances of the bones were exactly similar to those characterising osteogenesis imperfecta.

[1] *Am. Journ. Med. Sc.*, Phila., 1905, January.
[2] *München. med. Wchnschr.*, 1905, February 14.
[3] *Mitth. aus d. Grenzgebieten d. Med. u. Chir.*, 1905, Bd. xv. Hefte 1 and 2.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

Immunity in Infective Diseases. By Élie Metchnikoff. Translated by Francis G. Binnie. Cambridge University Press.

Amongst the numerous writings on the subject of immunity in recent times, those which have most influenced opinion and have contributed most to real advance are undoubtedly Ehrlich's and Metchnikoff's. The former has sought for an explanation of immunity in the bio-chemistry of the nutritional processes of the cell; the latter studies it in the light of the comparative physiology of defensive activities, which in their turn have in great part nutrition as their basis. Both workers have dealt with the same great problems from different points of view, and their general conclusions are more in harmony than is generally supposed. It is one of the great merits of Metchnikoff's work that it has been the means of giving to pathology a much wider outlook than it had before, and a vastly enhanced interest; it has broken down the barriers between pathology and other biological sciences, just as at present a similar process is going on in its relations to physico-chemistry. The distinctions drawn by pathologists between the various reactive processes are more or less arbitrary; they are all to be considered as parts of the means of defence of animal organisms against inimical surroundings. And the keynote of Metchnikoff's theory is that the vital activities directed towards defence under abnormal conditions have their basis in, and are evolved from, functions concerned with the maintenance of the normal life of the organism.

Many English readers are already familiar with Metchnikoff's work on phagocytosis as expounded in his "Comparative Pathology of Inflammation"; in the present translation of his "L'Immunité dans les Maladies Infectieuses" are presented an extension of his investigations along similar lines, and an application of his results to the explanation of the facts established regarding the changes in the blood serum as a result of immunisation. A study of the unicellular animal organisms, with which the book opens, shows that the flagellata and the ciliated infusorians are subject to invasion by some of the lower fungi, and that the destruction of the latter takes place by a process of digestion, indicated often by a slightly acid reaction in the digestive vacuoles. *Intracellular* digestion is here the chief feature, although in certain instances a digestive ferment can be separated. Mouton, for example, obtained from amœbæ a substance with weak proteolytic action. It is shown that amongst those lowly animal organisms certain important other properties are found, *e.g.*, the power of moving from the hostile parasite, the power of fixing, and in some cases of transforming, toxic substances, and the faculty of becoming acclimatised to poisonous bodies and unsuitable surroundings, etc.—all being factors of great importance in relation to general pathology. It is now generally recognised that the question of the means of the destruction of bacteria is but part of the general subject of the absorption of formed elements, *e.g.*, red corpuscles and other cells. This absorptive process thus demands special attention. If red corpuscles be introduced into the digestive tract of actinia or of planarian worms, it is seen that their destruction and absorption take place by means of intracellular digestion, and an analogous process is seen when they are injected into the body tissues of most invertebrates. On ascending the animal scale, we find that digestion becomes more and more an *extracellular* process, and ultimately almost exclusively so; that is, it takes place by means of secretions. In connection with this subject much importance is duly accorded to the work of Pawlow and his pupils, who have shown that the intestinal secretion contains a substance enterokynase, which greatly aids the subsequent action of trypsin; that is, the two ferments act in association. According to Delezenne, the source of enterokynase is not the epithelium but the lymphoid tissue of the alimentary tract. These facts form, according to Metchnikoff, the physiological counterpart to what is seen in the action of hæmolytic and bacteriolytic serums. If the blood corpuscles of the guinea-pig, for example, be injected into the tissues of the goldfish, their destruction is at first intracellular, but after two or three injections the lymph acquires hæmolytic properties; that is, the digestion is now in part extracellular. This subject of course involves a consideration of the properties of hæmolytic serums as revealed by the researches of Bordet and of Ehrlich and his co-workers. In the action of such serum, as is now well recognised, there are two substances concerned, the normally present alexin, cytase, or complement, and the specially developed immune-body, fixative, or *substance sensibilisatrice.* Both substances Metchnikoff regards as allied to ferments, and he holds that there is one important difference between them in addition to that stated, namely, that the fixative becomes set free in the plasma, whilst the cytase is contained within the leucocytes under normal conditions. This latter view is combatted by Ehrlich and others. Just as red corpuscles are chiefly destroyed by the macrophages and bacteria by the microphages, so there are two chief cytases, macrocytase and microcytase, which are derived from the corresponding cells; the origin of the fixatives is also to be ascribed to the same two classes of cells. The essential feature in the development of hæmolytic or bacteriolytic properties is that digestion at first intracellular becomes extracellular, and the digestive substances are derived from the cells in which the intracellular process can be seen. The fixatives or immune-bodies formed in large amount and set free during the process of immunisation are *ferments adjuvants,* analogous in their mode of action to enterokynase.

Such in outline is the leading idea as regards the destruction of bacteria and other cells; we have specially referred to this as it represents the modification and extension of the theory of phagocytosis in accordance with the facts more recently established. But it is scarcely necessary to add that all departments of the subject of immunity are fully discussed, and, we may add, with a lucidity and a wealth of interesting illustration rarely equalled. Natural and acquired immunity against micro-organisms, and the mechanism of such immunity, natural and acquired immunity against toxins, immunity of the skin and mucous membranes, immunity acquired by natural means, vaccination, and a historical survey of our knowledge of immunity, constitute the subject-matter of the chief chapters. The book is of the first rank as a scientific work, and is of the highest value alike to the pathologist, the physician, and the biologist; and it would be difficult to imagine a clearer or more interesting exposition of a subject which admittedly in parts is beset with difficulty. The translation has been admirably executed by Mr. Binnie, and the system of putting the number of the page in the original at the margin of the page in the translation, so that the original can readily be referred to, will be found to be a very convenient one.

The Sanitary Laws of Scotland and Principles of Public Health. By W. J. Brock, D.Sc. (Public Health), M.B., C.M., etc. Edinburgh: Oliver & Boyd.

The task of the reviewer in this case is not easy. A compilation of Acts and Forms which have been taken from existing publications or instructions from the Local Government Boards of England and Scotland, do not afford pabulum for a reviewer. One cannot therefore be hyper-critical. Dr. Brock's book is obviously designed to be a *vade mecum.* It is issued in convenient size, and has been well printed and bound. Perhaps the most useful portion is that for which Mr. J. A. Louttit Laing, M.A., LL.B., is responsible. This deals succinctly with the governing decisions which have been given from time to time in the Law Courts. Doubtless the book before us will prove useful to some, but it is not sufficiently complete to be absolutely reliable. For instance, on looking at the index we failed to find any reference to the Sanitary Accommodation Order, the putting into operation of which is one of the difficult problems connected with the Factory and Workshops Act. The Order has been left out, yet to know its terms is a necessity. The space devoted to the aforementioned Act, and the Housing of the Working Classes Act, is so small that one must refer to the full text of the Acts to be certain of one's ground. Under the Dairies, Cowsheds, and Milkshops Orders, it would have been well had a model set of regulations been inserted. To know that a local authority has power to make regulations is one thing, but the responsible official, the clerk for instance, would have been pleased to have had as a guide a set of model regulations.

Towards the end of the volume two sections on "Food" and "Vital Statistics" have been given. The former is very incomplete, and the latter inordinately long. Perhaps at a future date these faults may be remedied. It may appear strong criticism to make, but we hardly think the present volume fills the place intended for it by the author.

The Royal Medical and Chirurgical Society of London. Centenary 1805–1905. The Aberdeen University Press Limited.

This book has been written, at the request of the President and Council, by Dr. Norman Moore, honorary librarian, and Mr. Stephen Paget, honorary secretary, for the Centenary Festival of the Royal Medical and Chirurgical Society. Its primary object is to give, in outline, a history of the Society, and to commemorate in the Festival its founders and benefactors. Such a book, say the editors in their preface, should be welcome to the present Fellows of the Society.

The interest of the volume is, however, so great that it will be welcomed by all members of the medical profession who are privileged to read it. The work of compiling the book from the *Transactions and Minutes of the Society* must perforce have been great, but so ably have the editors performed their task, that they give us in some three hundred pages what is practically a history of medical and surgical progress during the last hundred years. No part of the book is redundant, and yet the authors do not sacrifice style to space, but have produced a volume of which, while every page is of interest, the whole may be read both with pleasure and with profit.

The book is divided into two parts, of which the first contains chronicles of the Society, compiled by Mr. Paget from the *Minute-Books, Proceedings, and Transactions of the Society*, while the second contains a short account of its presidents, of whom seven were happily able to aid in person the celebration of the centenary of the Society.

In Part I. we are able to trace the marvellous progress of the Society from the tenancy of two small rooms in Verulam Buildings at the rent of 95 guineas per annum, with a press-bedstead stuck in a corner of one of the rooms, and the clerk and his wife lodged in a gloomy little basement, to the purchase in 1889 of 20 Hanover Square, where, in 1896 the premises alone, without their contents, were valued at £51,150.

Of particular interest at the present time, when the union of the various medical societies is in the air, is the earlier proposals of union with other societies made to or by the Royal Medical and Chirurgical Society in 1808, 1850, 1860, and 1868. In 1808 union would have occurred between the Medical Society and the Medical and Chirurgical Society as it was then (the Royal Charter was granted in 1834), but the latter Society refused any concession of name which might lead to an inference that it had been absorbed by the former and older Society. The Medical Society, on the other hand, considered that any change of name would endanger the security of its property. Thus it would seem that the Medical Society of a hundred years ago showed more knowledge of the laws of property than certain churches of the present day. In 1868 a serious attempt was made to amalgamate the various societies into "The Royal Society of Medicine," but after two years of discussion the scheme fell to the ground.

Of the many papers, now of classic importance, read before the Society, space does not permit us to make mention. The profession has the editors to thank for rescuing other papers of importance, which had fallen into undeserved oblivion.

Part II. consists mainly of short biographical notices of all the presidents of the Society who are dead, with quotations from their writings, putting before us some characteristic of each president, or of the knowledge prevalent in his day. "It has been composed with the intention of the sage of old, 'Let us now praise famous men, and our fathers that begat us,'" a quotation in this case peculiarly applicable.

In this short review enough has, we hope, been said to indicate how much the Fellows of the Royal Medical and Chirurgical Society, and the medical profession as a whole, are indebted to the editors for this fascinating volume.

Nodal Fever. By ALFRED AUSTIN LENDON, M.D. London. With four Coloured Plates and five Charts. London: Baillière, Tindall, & Cox.

UNDER the above title, Dr. Lendon describes the disease usually known as erythema nodosum. It is his object to show, first, that it is an acute specific infectious fever, and, secondly, that it is the same condition as erythema multiforme. His monograph is based on the careful study of sixty-three cases, and well repays perusal, even if it is not always easy to agree with the author's opinions. At present there are two views on the causation of this interesting condition. Some physicians, and notably Dr. Stephen Mackenzie, hold that it is a manifestation of acute rheumatism. Others of us regard it as being probably due to some form of auto-intoxication. Dr. Lendon's cases certainly do not bear out the rheumatic theory. In a very small percentage of them was there any history of previous rheumatism, or even of a rheumatic family history. It has long been recognised that a prodromal stage with considerable fever exists, and it is on the occurrence of this stage and of the stages of eruption and of convalescence (often prolonged) afterwards that Dr. Lendon bases his theory that we are in reality dealing with an acute eruptive fever. As regards its infectious qualities, he is able to instance several interesting facts which have come under his notice. The occurrence of two cases in the same family may, he admits, be merely due to some peculiar predisposition, but he claims that he has seen cases of hospital infection. Moreover, in one case the infected person developed a circinate erythema, the infecting case being one of erythema nodosum. This, in his view, points to the identity of the various forms of erythema multiforme, as does the fact that in most papular erythemas there is a suggestion of nodes in some part of the body. Altogether, Dr. Lendon has produced a most interesting little book, and there is something to be said in favour of his idea that at least the time has now come for erythema nodosum to be taken out of the dermatological section of text-books of medicine.

Dietetics for Nurses. By JULIS FRIEDENWALD, M.D., and JOHN RUHRÄH, M.D. Philadelphia and London: W. B. Saunders & Company.

THIS admirable and concise work on dietetics is designed especially for nurses and laymen. However, it is in our opinion somewhat too elaborate for such a purpose. We question very much if anything is to be gained by that very superior person the trained nurse being able to point out to the family doctor that the diet he has ordered is deficient in protein, or does not contain the requisite number of calories. On the other hand, we readily admit that the book is very simply and clearly written, and puts a difficult subject in a very readable form. The chapters on infant feeding are particularly good, and will be found of use not only by the nurse but by the doctor also. Very good also is the chapter on rectal feeding, which contains many useful recipes for nutrient enemata. The appropriate diet for every form of disease is given in detail, and the whole book is full of valuable suggestions of a practical nature. British readers will gather many new ideas from the long list of recipes at the end of the book. Variety of food is of such value in the treatment of the sick, that the preparations there mentioned will be welcomed by all nurses. In our opinion the book, so far from being only useful to nurses and laymen, will be of much assistance both to the medical student and to the busy practitioner. It appears to us to contain all the practical side of dietetics, and being of a handy size and absolutely devoid of any "padding," it will commend itself to those who have neither the time nor the inclination to grope their way through more pretentious and more bulky works on the same subject.

Nouveau Traité de Médecine et Thérapeutique. Sous la directions de MM. P. Brouardel et Gilbert. II. "Fièvres Éruptives." Paris : Librairie, J. B. Baillière et Fils.

This new edition of a well-known system of medicine is issued in separate parts of a handy size, and contrasts favourably with the heavy volumes of the original edition. The fasciculus under notice, that on the eruptive fevers, contains articles on smallpox, chickenpox, scarlatina, measles, rubeola, and miliary fever (*suette miliaire*). All the monographs are good, and have that lucidity and charm which are so characteristic of French medical works. The article on smallpox, by Auché, has been brought thoroughly up to date, and mentions all the most recent bacteriological and other researches. We notice that Auché does not support the view of aërial convection of smallpox, believing that a few dozen yards is the utmost that the infection can be carried by air. Wurtz, in a very good paper on scarlatina, does not commit himself as to the etiological agent, and we gather that he is by no means satisfied that it is a streptococcus. He advises the cold bath in cases in which the temperature has reached 104° F., a procedure which may have its advantages if the rash is well developed, but which in our opinion might well be dispensed with. It is curious to find in Grancher's excellent article on measles that no mention is made of Koplik's spots, especially as in other respects this section seems well up to date. Those of us who, while finding the spots useful aids to diagnosis, think their value has been much exaggerated, would have been glad to have had a pronouncement on the subject from a physician of such experience. Grancher is convinced of the infectivity of bronchopneumonia complicating measles, and there is certainly much to be said for this contention. Netters' contribution on rubeola is somewhat scanty, and in mentioning fourth disease he seems to have the impression that its existence is accepted by most British medical men, which is hardly correct. In conclusion, we may say that the whole volume is an improvement on the first edition, and if there was only an index, the absence of which seems to be the rule in French books, it would leave nothing to be desired.

The Food Factor in Disease. By Francis Hare, M.D., Inspector-General of Hospitals for Queensland, etc. 2 vols. London, New York, and Bombay: Longmans, Green, & Co.

In these two bulky volumes the author sets out a new pathological theory to which he applies the term "hyperpyræmia," meaning thereby a condition in which there is present an excess of carbonaceous material in the blood. He believes that this morbid condition of the blood is responsible for the production of the paroxysmal neuroses, migraine, asthma, angina pectoris, and epilepsy, as well as such diverse diseases as gout, glycosuria, acute mania, bilious attacks, catarrhal affections, and circulatory, renal, and other degenerations. The opening chapters contain a good summary of our present knowledge of nitrogenous and carbonaceous metabolism, and the laws which govern these are well contrasted. In succeeding chapters the author considers the methods by which the carbonaceous contents of the blood are regulated. He disputes the current and, as he terms it, optimistic assumption, that any excess of carbonaceous material in the blood is normally and easily stored up as fat; indeed, he regards the disproof of this assumption as one of the chief objects of his book. In attempting, however, to show that carbonaceous material can accumulate in the blood—which is the basis on which his whole theory rests—he proceeds by his own admission on purely deductive reasoning; he confesses—and this is the weak point of the whole position—that he can give no chemical proof of it. To anyone who inquires as to the form in which the excess of "carbonaceous" material accumulates he has no reply to give. The author, however, is not daunted by this lack of chemical support. Having convinced himself that such accumulation can take place, he proceeds to apply his theory to the explanation of all the diseases already enumerated, as well as some others, regarding them all as different ways in which a pathological "decarbonisation" of the blood is brought about. Into the details of this explanation, which make up the chief bulk of the book, it would be idle to attempt to follow him. Anyone who is prepared to swallow the initial assumption upon which the theory rests will have no difficulty in approving the author's exposition of the "meaning, mechanism, and rational treatment" of the paroxysmal neuroses and other diseases to which the theory is applied.

Serious criticism of such a book is almost impossible, for if the author is prepared to dispense with any chemical support, what more is there to be said? We will confess, however, that we have read it with interest as an example of a modern attempt to re-establish a humoral pathology, and with amusement as an ingenious turning of the tables on the supporters of the uric acid theory of the same class of diseases. The author out-Haig's Haig with a vengeance; and in these days, when serious physiologists, such as Chittenden, are preaching that the proteid standard in diet is too high, it is refreshing to come across a free-lance who boldly proclaims (vol. ii. p. 377) that it is inadequate. It is only fair to add that the book is well written, and that the style is clear and well knit, though the thought may be obscure and the logic loose. We cannot help thinking, however, that the author would have done himself more justice and secured for his theory a more patient hearing if he had presented it in a more compact form.

Transactions of the American Pediatric Society. Volume xvi.

The pages of the *Transactions of the American Pediatric Society* may always be relied upon to furnish interesting papers and to provide profitable reading. The sixteenth volume forms no exception to this rule, and contains many contributions of more than average merit. Several papers were read before the Society on the subject of "Pyloric Stenosis in Infancy," from the perusal of which one arrives at the conclusion that there is still a considerable difference of opinion as to the frequency of the occurrence of this condition, as to the reliance to be placed on the individual symptoms in forming a diagnosis, and as to the period at which surgical interference should be entertained.

Rotch contributes a paper on "Considerations regarding Substitute Feeding," in which he once more reiterates his often-expressed opinions concerning the value of percentage modification of milk, and deprecates the feeding of infants by rule of thumb.

Rachford has an interesting paper on "Gastro-intestinal Toxemia," in which he calls attention to the excess of indican and of the æthereal sulphates in the urine in such cases.

One of the most valuable papers in the volume is by Churchill on "Acute Leukæmia in Early Life." He considers that the condition is more common than is generally supposed, that all cases are of myelogenous origin, that the course in children differs from the adult type in minor details only, and that the disease is always fatal. Many other papers might be quoted, but enough has been said to show that the American Pediatric Society has many able and earnest workers in its ranks.

NOTES ON BOOKS.

Wellcome's Photographic Exposure Record and Diary.—It is not easy in a short notice to set forth all the excellences of this small book. Many must know it, and to those who do not, we can conscientiously recommend acquaintance. It contains amongst other valuable information for the photographer, a list of English, Continental, and American plates and films, monthly light tables, exposure calculator and a great deal more, all comprised in a small compact pocket-book.

Wellcome's Medical Diary and Visiting List.—This excellent pocket-book is typical of all Burroughs, Wellcome, & Co.'s productions. It is well got up, handy, and in addition to the diary and visiting list, contains a mass of most useful information. It forms a veritable *vade mecum* for the general practitioner, and it will be found to be not only accurate itself, but also to induce accuracy and method in those who use it.

The "Arboreta" Medical Case-Book (John Walker & Co. Ltd. London).—This is a loose leaf medical case-book, that is to say, by an ingenious arrangement leaves can be added or taken out for preservation. The contents can be made up according to individual desire: thus they may be partly case charts, diary leaves or note, and cash ruled leaves, so that the practitioner can have a pocket-book, diary, and case-book in one.

The small charts, diagrams of the body outline, and other details, are excellent, while the simplicity of the device and arrangement, together with the handsome pigskin cover, make the "Arboreta" case-book a most useful possession.

The first edition of this work—*Select Methods of Food Analysis*, Leffmann and Beam (Rebman, London)—has already become so well and favourably known, that but little need be said of the second editon, now published. In its present and enlarged form the book is admirably suited to the needs of the practical worker in food analysis, and in the detection of food adulteration. It has been brought up to date as regards "preservatives," especially as to methods for the detection of formaldehyde, boric acid, sulphites, etc. The subject of milk and milk products is very fully dealt with, and throughout the descriptions of the various processes are clear and detailed. The work remains one of the best on the important subject with which it deals.

The author of this little book—*Guide to Finger-Print Identification*, by Henry Faulds, L.F.P.S. (Wood, Mitchell, & Co. Ltd., Hanley, 1905)—claims that he was the first to propose the use of finger-prints for identification, in an article which appeared in *Nature* in October 1880. With the question of priority in suggesting the use of finger-prints the public have very little interest, and the constant reiteration of the author's claim becomes somewhat tiresome. The book, however, is well worth reading by those who are interested in the subject. It contains a short account of the principles of "dactylography," a term which we agree with the author is more suitable than "dactytoscopy," and some very useful hints as to the presentation and scrutiny of cases in judicial practice. There are many really excellent illustrations, which serve to bring out the points under discussion with great clearness.

No better testimony of the excellence of this book—*Hygiene and Public Health*, by Whitelegge and Newman, Tenth Edition (London: Cassell & Co. Ltd.)—can be afforded than the fact that, notwithstanding the many works on public health which have appeared in England and America, this one in the space of only fifteen years has gone through ten editions, and has also been three times reprinted. We have always regarded "Whitelegge" as by far the best of the smaller manuals on hygiene which have appeared either in this country or abroad, and a perusal of the latest edition fully confirms us in this view.

With a science which advances at such a rapid rate, careful revision, a considerable amount of rewriting, and some enlargement are absolutely necessary, and this work has been well done by the authors. We confidently recommend the book as a thoroughly up-to-date and reliable manual for the purposes of the medical officer of health and of the student.

The fourth edition of Taylor's *Sanitary Inspector's Handbook* (H. K. Lewis, London, 1905) is somewhat larger in bulk than its predecessors, as one would naturally expect, looking to the new appliances, new legislation, and constant progress in sanitary science. But it still remains a compact handy volume, containing a great deal of most useful information for the sanitary inspector or those desiring to acquire a practical knowledge of sanitation. A valuable synopsis of various Acts dealing with public health, including the Public Health (Scotland) Act, 1897, forms an excellent feature of the book, while candidates for examinations will find the numerous questions which have been set by the Sanitary Institute and other bodies of great assistance to them.

This little book—*Poisonous Plants of all Countries*, by A. Bernard Smith (John Wright & Co., Bristol, 1905)—may prove useful to those interested in toxicology as an aid in identifying poisonous plants. The scientific and popular names of the various plants are given, together with their botanical characters and toxic principles, and the compilation has been carried out with care and accuracy. We think it is a pity, however, that the author has adopted the somewhat pedantic classification of poisons of Guy and Ferrier in place of a simpler one.

The Child's Diet, by J. S. Curgenven, M.R.C.S. (London: H. K. Lewis, 1905), is a little book written chiefly for the instruction of mothers, rich as well as poor, and gives the author's views on the feeding of the infant and the child, and on the treatment in them of derangements of the alimentary canal. The chief points insisted on in connection with infant feeding are the danger in prolonged use of predigested foods, and the fact that no unaltered starch should be given until the time of teething. For the older child he recommends more fat and less starch and sugar than are contained in the usual diet, and the giving of the starch in a form requiring thorough mastication. Diet tables and recipes are added.

In *Carcinoma of the Rectum*, by F. Swinford Edwards, F.R.C.S. (London: Baillière, Tindall, & Cox, 1905), the author shortly discusses within fifty pages the symptoms, mode of examination, differential diagnosis, and treatment of the disease, with an epitome of forty successive cases operated on by him. The trans-sacral route is the method which he advocates. Thirteen of the forty cases are known to be in good health, six having now exceeded the three years' limit. The publication of statistics of operative results is always interesting and valuable, but there is nothing new in the preliminary part of the book.

Dispensing made Easy, by W. G. Sutherland, M.B. (Bristol: John Wright & Co., 1905), is intended for the practitioner who does his own dispensing, especially on a large scale, as in club practices. Its object is to show how, without sacrificing efficiency, time and money may be saved, for example by the use of concentrated solutions, stock mixtures, and economical substitutes for expensive pharmacopœial preparations. There are also hints on fitting up a dispensary and a list of useful formulæ. The book is of interest only to practitioners in the class referred to, but the fact that this is a second edition seems to indicate that it is appreciated by them.

The Transactions of the Glasgow Obstetrical and Gynæcological Society, vol. iv. (Glasgow: Alex. Macdougall), is a record of the work of the Society during two sessions. It contains a summary of the various papers read before the Society on subjects connected with obstetrics, gynæcology, and the infant, and lists of specimens shown. Needless to say, the subjects are varied, and many are of considerable interest.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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The Afferent Nervous System, from a New Aspect.

Dr. Henry Head's investigations of problems connected with cutaneous sensation are already well known and of established authority; his most recent piece of work (*Brain*, London, 1905, No. 110) is a highly important contribution to the subject, and shows us the afferent nervous system in quite a new aspect. Those who are familiar with Dr. Head's work know how unassailably his inductions are fortified by the multitude of observed facts on which they rest, hence this summary gives only the general principles he has discovered; apart from these, the paper contains an immense amount of detailed research on the exact distribution of the peripheral cutaneous nerves, as well as an account of ingenious test-methods, with the precautions necessary for avoiding incidental fallacy.

According to Head, and his co-workers Rivers and Sherren, the sensory mechanism in the peripheral nerves consists of three systems —(1) *Deep sensibility*, capable of answering to pressure and movement of parts, and even capable of producing pain under the influence of severe pressure. (2) *Protopathic sensibility*, capable of responding to painful cutaneous stimuli and to the extremes of heat and cold. This is the great reflex system, producing a rapid, widely diffused response, unaccompanied by definite localisation of the stimulus. (3) *Epicritic sensibility*, the most highly specialised, by which the locality of stimuli is apprehended, adjacent stimuli are discriminated, and minimal touches, as well as finer grades of temperature, are recognised. Leaving aside deep sensibility for the present, let us consider the relations of protopathic and epicritic sensibility. When a nerve, say the median, is divided, sensation is entirely lost over a given area (in this case the index and middle fingers), while, in the regions adjoining, sensation is diminished but not abolished. Dr. Head has discovered that the area of diminished sensitiveness is one in which some kinds of sensibility are lost, others retained. The anæsthesia, in fact, is to epicritic sensibility only—light touches being unperceived, the points of a pair of compasses 2 cms. apart not being recognised as separate, and temperatures between 22° C. and 40° C. not being felt. In the area of complete anæsthesia sensations of pain and extremes of heat and cold (*i.e.* protopathic sensibility) are abolished as well as epicritic sensibility. The relative extent of the two areas differs greatly in individual cases, but when a peripheral nerve is divided the area of epicritic always exceeds that of protopathic anæsthesia. (This does not hold for division of roots—an important point which will again be referred to.) The boundaries of epicritic anæsthesia are sharply circumscribed; those of protopathic anæsthesia are less exactly defined. Further light is shed on the two forms of sensibility, by the process of *recovery of sensation after suture of a divided nerve.* As soon as recovery begins, the analgesic area diminishes, and finally pricks are appreciated all over the realm governed by the nerve; while this is going on, and it may be for several months thereafter, the epicritic anæsthesia remains complete over its original distribution. We thus have a paralysis of the sensibility to light touch, warmth and coolness, and localisation, along with the presence of protopathic sensibility; consequently the latter can be tested, uncomplicated by the other form of sensibility. Stimuli applied to a part where protopathic sensibility reigns alone have, as one peculiarity, the production of *diffuseness of sensation.* A prick causes a painful feeling of tingling, not merely locally but widely spread over the affected area. In addition to this, while recovery is actually in process, pricks produce much more intense and prompt reaction than either under normal circumstances or in the zone of diminished sensibility during the period immediately subsequent to injury. Heat and cold, too, are felt more promptly in the recovering area than in the original intermediate zone from which epicritic sensibility was abolished by the nerve lesion. The temperature sense is also very definitely affected in another way, all temperatures below 20° C. being felt alike as equally "ice cold," while water above 50° produces a hot, stinging sensation. Between these extremes, objects are not recognised as either cold or warm. The affected parts may remain in this condition—protopathic sensibility regained, epicritic lost—for several months. Then, if the nerve has united well, the border for loss of light touch is found to be less definite than before, and there is concomitant return of the power to discriminate temperatures between 25° C. and 40° C., as well as to apprehend as separate the points of a pair of compasses 2 cms. apart. At the same time, the characters of protopathic sensibility become less evident; painful stimuli produce less diffused and tingling sensations. After complete division of a nerve, the skin does not as a rule regain normal sensibility for more than two years. Even after light touches can everywhere be felt, the old border of epicritic anæsthesia may be detected by dragging a pin lightly across it, from normal to affected side; as the line is crossed a diffused, tingling, painful sensation is produced. Though rarely, recovery may be arrested at the end of the first stage, the parts remaining provided with protopathic sensibility only. The rule, however, is that if the skin becomes sensitive to pricks, light touches will ultimately be appreciated, though restoration may not be absolute. The most delicate test of entire recovery is the disappearance of the boundary line of epicritic anæsthesia, as shown by the passage of a needle point across its site, without pain being produced thereby. Whenever the diffusion and disagreeable tingling, characteristic of protopathic sensibility, intrude themselves, the power of discriminating compass points will be found diminished, a sign that the highest forms of sensibility have not completely returned.

It has already been stated that the margin of epicritic anæsthesia is well defined, while that of loss of protopathic sensibility is not. The extent of the area of the former corresponds exactly with the anatomical distribution of the peripheral nerves, and recovery is not due to overlapping fibres from neighbouring trunks. The length of time required for this form of sensation to be restored shows that recovery is due solely to a return of conduction. The ill-defined border and small size of the analgesic patch, compared with the anatomical distribution of the nerve, shows that in the case of the fibres conveying painful impulses there is great overlapping; this may be a factor in recovery, when sensation returns with unusual rapidity, but there is no evidence that protopathic sensibility is regained by an analgesic area without restoration of the divided nerve.

Effects of injury or incomplete division of nerves.—Injury may produce all the results, both sensory and motor, which follow division of a peripheral nerve. Both forms of sensibility, however, begin to return at approximately the same time, and are regained *pari passu*. If, therefore, gradual diminution in analgesia is accompanied by restoration of the power of appreciating light touches, it is a sign that the nerve has not been completely divided.

As has been said, when the lesion affects a peripheral nerve, the area of epicritic anæsthesia involves the whole cutaneous distribution of the nerve, and considerably exceeds in size the region of protopathic anæsthesia; there is, moreover, practically no overlap of epicritic fibres. From this it follows that the peripheral nerve is the unit of epicritic supply, while, so far as protopathic sensibility is concerned, no one nerve forms more than a tributary supply of an area innervated by a plexus of overlapping fibres. If, however, the lesion affects a cord of the brachial plexus, the extent of the analgesia almost equals that of loss of perception of light touch, while, when several posterior roots have been divided, the area insensitive to prick may exceed that insensitive to light touch. The unit of protopathic supply, therefore, is the nerve root. The more nearly a peripheral nerve represents the supply of one or more posterior roots, the more definite will be the borders of the analgesic zone caused by its division. In further proof that the two forms of sensibility are conveyed by separate sets of fibres, Head instances an accident of nerve distribution in his own case which led to the production, after nerve-section, of a patch of protopathic anæsthesia with retention of epicritic sensibility. The unequal rate at which the two systems recover, and the fact that the length of nerve to be regenerated makes little difference in the date of return of protopathic sensibility, while it greatly influences the time at which epicritic sensibility is restored, is additional evidence of the independence of the two sets of fibres.

Sensations of temperature.—Return of sensibility to temperature is due to the reappearance of hot and cold spots. In the normal skin there are minute areas peculiarly sensitive to heat and cold, set in a territory over which also temperature stimuli can be generally appreciated; but during the stage of recovery from complete analgesia, these spots are set in skin otherwise devoid of the power of responding to stimulation with hot or cold objects. This allows them to be detected with facility, and it is found that, when they are stimulated by heat or cold respectively, what may be called an explosion of the sensation occurs—a feeling of heat or cold radiating widely in all directions. The intensity of the sensation depends more on the number of spots stimulated than on the actual temperature of the stimulus.

Sensibility of the hairs.—Sometimes it is found that light touches (stroking with cotton-wool) are detected unusually early after union of a divided nerve. The sensation produced has the radiating, tingling quality of protopathic sensibility, and is due to stimulation of the hairs; when the skin is shaved it becomes totally insensitive. Head brings forward clinical evidence that hairs have a double innervation, one which when stimulated by touching or pulling the hairs conveys painful or tingling sensations, the other conducting the normal, well localised tickling sensation.

Hyperalgesia.—Excessive reaction to prick has already been noticed as a characteristic of an area of protopathic sensibility, deprived of the higher epicritic sensibility. It also occurs in cases of bullet wounds of nerves, and in such cases the hyperalgesic zone extends far outside the limits of epicritic anæsthesia. From the fact that it may disappear, immediately on the nerve trunk being freed from scar tissue, it is presumably due to irritation of the nerve fibres (probably those conveying protopathic sensibility, which, as stated, overlap greatly).

Changes in the skin and nails associated with nerve injury.—The liability of an anæsthetic area to ulcers, blisters, etc., is well known. Whether due to trauma or not, these nutritional defects never extend beyond the limits of the analgesia, and disappear with the return of protopathic sensibility. Similarly the skin becomes dry, rough with piled-up epithelium from cessation of desquamation, and inelastic over an analgesic area, regaining its pink colour as sensation to prick returns. From this condition we must distinguish the totally dissimilar "glossy skin" due to hyperalgesia from nerve injury. Simple fixation of the hand, *e.g.* by bandaging the fingers to a splint, retards the growth of the nails; those of the opposite hand grow thrice as fast as those of the immobilised one. Massage prevents this retardation, but does not affect normal growth. After division of nerves, growth of the nails may be checked; but the most potent cause of this is diminished movement, since, unless muscles have been paralysed or tendons cut, it does not occur. In well-marked hyperalgesia with glossy skin, the nails become thin, curved, and their growth probably goes on with unnatural rapidity.

Deep sensibility.—When cutaneous nerves only are divided, touches with blunt objects are surprisingly accurately localised, but cannot be distinguished from pricks. Widely separated points of compasses are not felt as double. Any stimulus which drags the skin over deeper organs is appreciated, but if the skin be raised from the subjacent structures, touches are not felt. Firm pressure gives rise to a painful sensation of bruising. The deep sensibility is due to afferent fibres which run with the motor nerves, and subserve muscles, joints, and tendons. Even division of both ulnar and median at the wrist produces little loss of deep sensibility, unless the tendons are also cut through. Wrong appreciation of the nature of this form of sensibility has given rise to the many conflicting accounts of sensory disturbance following nerve division.

The nature of the afferent nervous system.—Protopathic sensibility was defined at the outset of this summary as a great reflex system, and this demands a brief explanation. After colotomy the sensibility of the functionless lower gut can be tested, when it is found that while medium temperatures are not detected by the mucous lining of the bowel, ice water is recognised as "cold," and water above 50° C. as "hot." These sensations are not definitely localised, even to the abdominal cavity. Water at a medium temperature, which evokes no sensation, sets up afferent impulses and the desire to defæcate. The viscera thus seem to be endowed with a low form of protopathic sensibility, comparable to that of the skin in producing badly localised, radiating, and frequently misreferred sensations. Thus we may speak of somatic and visceral protopathic fibres. Secondly, we have visceral afferent fibres connected with the Pacinian organs; these resemble the mechanism in the limbs subserving deep sensibility and sense of position, whence it is inferred that they are analogous, and enable us to apprehend visceral movements. Thirdly, we have the highly developed epicritic sensibility, restricted to the skin, and endowing it with its special tactile and localising sense.

SURGERY.

UNDER THE CHARGE OF

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Treatment of Tuberculosis of Joints.

In the interesting and instructive discussion ("Internat. Soc. of Surg.," *Rev. de chir.*, Paris, 1905, October) on the treatment of tuberculosis of joints, the general trend of opinion was distinctly towards conservatism. Bier of Bonn sounded the keynote of the discussion in the remark that articular tubercle is not only a disease which can be cured, but that it shows a marked tendency towards spontaneous recovery if the patient be placed in a favourable position to give the natural processes free play. All who took part in the discussion were agreed as to the supreme value of open-air treatment, particularly at the seaside, plenty of sunshine, and careful dieting. The importance of ensuring absolute rest of the affected joint was also duly emphasised. Kocher alone declared himself a partisan of early operation in general, in the hope of eradicating all tuberculous foci. The cure, he thinks, is thus more rapid, more sure, and more radical. He has seen patients, apparently cured by conservative measures, subsequently succumb to miliary tuberculosis arising from a latent articular focus.

Bier put forward a strong plea for his method of treatment by passive congestion by means of a rubber band applied on the proximal side of the affected joint. The band is applied for from one to three hours a day, and it should not be tight enough to cause any pain or discomfort. If œdema supervenes, it is relieved by elevation of the limb. He employs this method even when sinuses are present, the dressing being removed while the band is applied. If a cold abscess develop during the treatment, it should be evacuated by a small incision or by aspiration. He employs passive congestion at all ages. He considers the injection of antiseptics into the joint useless, and he does not employ iodoform injections along with congestion. The only contra-indications are advanced pulmonary tuberculosis or waxy disease, in which cases amputation is to be preferred; also when the limb has assumed a vicious attitude, and then resection should be carried out to correct the deformity. During the treatment by congestion, care must be taken, except in the knee or ankle, that ankylosis does not occur. Gentle massage and careful passive movement are indicated to prevent this. Bier recommends that, as far as possible, patients suffering from articular tuberculosis should be treated as out-patients, and not in the wards of the hospital. His statistics, which will be referred to later, lead him to favour this method for all joints except the knee, in which resection is preferable. It is to be noted that in the discussion Bier's method did not find much support save from Kocher, who employs it in chronic forms of tubercle with mobility of the joint.

The various methods of treatment by *injections* received more support. Broca, for example, strongly advocates the injection of 1 in 10 solution of iodoform in ether, after aspiration of the fluid, in all cases of hydrarthrosis in children. He prefers this preparation to suspension of iodoform in glycerin, and to the interstitial injection of chloride of zinc recommended by Lannelongue, although he admits that good results are obtained by these substances. Bier reserves iodoform injections for cases of tuberculous hydrops and for intra-articular cold abscesses. The good effects are due to the hyperæmia induced around the tuberculous foci. Garré is an advocate of iodoform injections, with immobilisation, in all joints except the knee and tarsus. Walther is strongly in favour of Lannelongue's interstitial injections of chloride of zinc, which he employs even in adults. He seldom operates for articular tuberculosis, beyond occasionally scraping out bony foci.

Referring to articular tubercle *in children*, Broca expressed his belief that hydrarthrosis in young subjects is always tuberculous, and in the great majority of cases can be cured by attention to the general hygiene, immobilisation, compression, counter-irritation, and the injection of iodoform. Cutting operations are seldom called for. Excision of the synovial membrane (synovectomy) is no more efficient than more conservative measures, and it is insufficient when there is disease in the bone, as is usually the case in children. Broca condemns resection in children, on account of the shortening which inevitably follows. Even when an abscess forms in a joint the seat of white swelling, Broca tends to adhere to conservative measures, withdrawing the pus and injecting 1 in 10 solution of iodoform in ether. Scraping the bone, followed by cauterisation, is sometimes indicated, but is liable to lead to local reinfection. Amputation is seldom necessary in children, and is only to be done in chronic septicæmia or threatened waxy disease. Sinclair-White and Verneuil expressed opinions similar to those of Broca.

With regard to the treatment of the individual joints, the following are the general conclusions:—

Wrist.—Bier reported seventeen cases (five with sinuses and five with cold abscesses) treated by passive congestion. Fifteen were cured with movable joints, the mean period of treatment being about a year. Willems finds that conservative treatment, with injections, yields good results, especially in patients under 20 years of age. Resection is indicated only when the disease is widespread, of long standing, and rebellious to conservative measures. Ankylosis is less serious than at the elbow or shoulder, but it is necessary to ensure movement of the fingers. Amputation is only called for in old or cachectic patients, or where there is advanced pulmonary disease.

Elbow.—Of eleven cases of disease of the elbow treated by Bier's congestive method (five with sinuses and five with cold abscesses), eight were cured with movement, and three improved. The mean period of treatment was nine months. Willems prefers resection to conservative measures, as a movable joint is the object aimed at. The removal of bone should be free, and movement should be commenced very early after the operation. Amputation is very rarely called for in tuberculosis of the elbow.

Shoulder.—Bier reports only one case treated by congestion, and it was cured with a movable joint. Willems favours early operation in disease of the shoulder. In children, as growth takes place chiefly at the upper epiphysis, care must be taken not to remove much bone from the humerus. Early movement is necessary to secure a movable joint.

Tarsus and ankle.—In Willems' experience conservative measures have yielded wonderfully good results in children, but in adults he prefers resection. Amputation is called for in aged and in feeble patients. Garré advises operation, having obtained 80 per cent. of good results by resection, as against 43 per cent. by conservative measures. Verneuil prefers amputation in adults. Walther has obtained good results by Lannelongue's interstitial injections between the diseased and the healthy parts. Bier reports thirteen cases (eight with sinuses and six with cold abscess) treated by congestion. Eight were cured, three improved, one not affected, and in one amputation became necessary. The mean period of treatment was ten months.

Knee.—The general opinion is in favour of operation in tubercle of the knee. Bier, for example, only cites five cases in which he persevered with passive congestion. Three were cured (two with movement) and two were improved. In eight other cases he tried congestion for a short time and then resected the joint. Willems is inclined to try conservative measures in patients below 15 years of age, and if this fails he advises amputation, especially if there are sinuses, or if suppuration is present and the general health of the patient suffers. In these young subjects, resection, even when intra-epiphysial, gives deplorable results, and arthrectomy is to be condemned on account of the risk of leaving osseous foci. In adults, on the contrary, resection gives very good results, but amputation is to be preferred when there is advanced visceral disease, waxy degeneration, or numerous sinuses with disorganisation of the joint. Lebrun has only had good results from conservative measures in children in cases of hydrarthrosis. For all others he has recourse to operative treatment; but care must be taken to perform resection in such a way as to prevent shortening of the limb. Garré is a strong advocate of operation in preference to conservatism. He cites 185 operation (eight synovectomies, 177 resections), with 94 per cent. of good results. Sinclair-White advises excision in adults. He has performed fifty operations with one death, and in the great majority of cases obtained a useful limb.

Hip.—In Willems' opinion conservative measures are nearly always efficient in children. If suppuration ensues and fever persists, resection is indicated. In the adult, resection of the affected bone is indicated. Radical operations, such as Kocher's, are reserved for exceptional cases, where, on account of the general condition of the patient, it is necessary to get rid of the local disease as rapidly as possible.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Pyelonephritis in Pregnancy and Puerperium.

Opitz (*Ztschr. f. Geburtsh. u. Gynäk.*, Stuttgart, Bd. lv.) has collected seventy-nine cases, and reports five cases from the Marburg Klinik. He points out three possible methods of infection bringing about the condition of uretero-pyelo-nephritis—(*a*) An ascending infection from the bladder; (*b*) infection from the urine itself; (*c*) infection by way of the lymph channels. The last is probably the cause of the condition in the puerperium. During pregnancy dilatation of the ureters (especially the right one) is common, and this prevents the usual valve-like communication between the ureter and bladder from acting in such a way as to prevent ascending infection. Opitz believes that the usual obliquity of the uterus to the right side explains the greater frequency of the right ureter being pressed on as it crosses the pelvic brim. The symptoms usually begin about the fifth month, often with rigors, pyrexia, rapid pulse, abdominal pain. The amount of urine is diminished, and contains pus, epithelial cells, and micro-organisms. Delivery is usually followed by improvement, which may, however, only be temporary. In twenty-three out of fifty-three cases spontaneous premature birth occurred, and seven out of sixty children were still-born. The treatment recommended is milk diet, urinary disinfectants, and washing out the bladder when cystitis is severe. Such treatment failing, the induction of labour or operation on the affected kidney has to be considered.

VAGINAL HYSTERECTOMY FOR HÆMORRHAGE FROM RUPTURED CORNEAL VARICOSE VEIN.

SIMPSON (*Am. Journ. Obst.*, N.Y., 1905, November) points out the usual causes of uterine hæmorrhage, and refers to rare cases of spontaneous rupture of large varicose veins in the substance of the uterine wall. He reports the following case:—P., æt. 45, 7-para, last pregnancy twenty months before coming under observation. History of three attacks of excessive hæmorrhage in three months, which caused marked anæmia and weakness. Vaginal hysterectomy. On opening the uterus, a varicose vein, 2 cms. in diameter, was found in the right cornea, containing a large blood clot, and in the immediate vicinity several dilated veins, measuring 4–6 mm., were discovered. The uterus was very soft and flabby. Simpson regarded the case as one of extreme vascularity of the uterus, with sclerotic arteries and varicose veins. A coloured illustration accompanies the description of the case.

ALBUMINURIA AND THE INDUCTION OF LABOUR.

VEIT (*Berl. klin. Wchnschr.*, 1905, No. 27) holds that neither albuminuria nor the kidney of pregnancy alone constitutes an indication for the induction of premature labour. Ascites, hypertrophy of the left ventricle, albuminuric retinitis demand such interference. Any disturbance in the patient's general condition, such as dyspnœa from cardiac failure, or irregularity of the pulse, with nephritis, likewise indicates the necessity of terminating pregnancy.

TREATMENT OF PRURITUS VULVÆ.

LERREDE (*Rev. prat. des mal. cut.*) recommends the following for the relief of this generally regarded intractable condition. The external and internal surfaces of the labia majora and minora are smeared with zinc paste, and a gauze drain is introduced into the vagina to keep the mucous surfaces apart. This treatment has to be repeated after micturition. When the condition is associated with skin troubles or lichenification, the combination of the above treatment with radiotherapy nearly always effects a cure.

THE TREATMENT OF PUERPERAL INFECTION.

V. ROSTHORN (*Deutsche med. Wchnschr.*, Leipzig, 1905, No. 23) condemns too active local treatment in the early stages of puerperal infection, and he would reserve the use of the blunt curette to the removal of retained incomplete abortion. He recommends, however, early douching with large quantities (6–8 litres) of a weak, antiseptic solution at low pressure, combined with ergot internally. In anæmic patients, saline infusions with nuclein internally have given good results. Rosthorn limits hysterectomy to the following complications:—Gangrenous tumours of the uterus and strongly adherent placenta. Resection of infected veins has, he thinks, a very limited field of usefulness, but he recommends silver applications (argentum colloidale), either as an external application or by intravenous injection. He gives serum in large doses as a prophylactic and in the early stages of infection.

Degeneration of the Ovaries in Carcinoma of the Uterus.

Jayle (*Rev. de gyn.*, Bd. viii. No. 6) states that the ovaries may be affected with carcinoma, as a direct extension of the uterine disease in advanced cases, or as a metastasis through the lymphatics. In the latter condition the ovaries may appear normal in the early stages of uterine carcinoma, or they may be the primary focus of the disease, or undergo fibrous degeneration. Jayle thinks the ovaries should be removed in all cases of hysterectomy for carcinoma.

Primary Epithelioma of both Fallopian Tubes.

Rollin (*Bull. et mém. Soc. anat. de Paris*, 1905, January) reports the following case:—P., æt. 46, complained of a well-defined, tender swelling in the right iliac fossa, which on vaginal examination felt like a horse-shoe shaped swelling in the pouch of Douglas. At the operation it was found that there was a swelling about the size of an orange in connection with the right tube, and a smaller tumour attached to the left one. Both contained chocolate-coloured fluid. The ovaries and appendix were normal. Histological examination showed the tumours to be primary epitheliomata of the tubes, the ovaries and uterus being unaffected.

Inguinal Hernia of the Uterus.

Birnbaum (*Berl. klin. Wchnschr.*, 1905, May) considers hysterocele a very rare condition. The hernia may be inguinal, femoral, umbilical, or through the linea alba. He reports the following case:—P., æt. 35, married, had never menstruated. The uterus was infantile, the left ovary rudimentary, right tube and ovary absent, left tube present, but without a fimbriated extremity. The whole swelling protruded through the inguinal ring, and descended into the labium. The tumour was successfully removed. Birnbaum has collected twenty-three similar cases. In eight, pregnancy had occurred, one ended in abortion, two in premature labour, four were terminated by Cæsarean section, one by Porro's operation. In most of the cases there was spasmodic pain at the menstrual period. Taxis is useless, operation being always necessary. When rudimentary the genitals should be removed. If normal they may be separated from the hernial sac and returned to the abdomen.

THERAPEUTICS.

UNDER THE CHARGE OF
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The Influence of Adrenalin Chloride on Toxic Doses of Cocaine.

Berry has performed a series of experiments on guinea-pigs, to determine what is the exact action of adrenalin chloride on toxic doses of cocaine. Braun and other observers hold that the association of adrenalin and cocaine lessens the toxicity of cocaine, while the anæsthesia produced is more energetic, and lasts longer. On the other hand, Thies found that control cats, receiving only injections of cocaine into the lumbar canal, survived doses which proved fatal when mixed with adrenalin. In his own experiments, Berry employed intra-peritoneal injections on guinea-pigs. He used large doses of cocaine, and finds that adrenalin does not protect the organism against toxic doses of cocaine. Consequently, in using adrenalin-cocaine solutions, care must be taken to avoid using a toxic dose of cocaine, as adrenalin not only fails to protect against toxic doses, but even seems to enhance the toxic effect.—*Am. Journ. Med. Sc.*, Phila., 1905, November.

The Changes produced in Blood Vessels by Suprarenal Preparations.

Hedinger has found that after the intravenous use of adrenalin and subcutaneous injections of hæmostasin, characteristic changes take place in the aorta of the rabbit. There is localised necrosis and calcification of the muscular elements of the media, along with more or less severe damage to the elastic fibres. The condition is essentially a mesaortitis, and corresponds entirely with the descriptions of previous observers. By the strict limitation to the media it differs from the arteriosclerotic changes which occur in man. It presents more analogy to the arterial change produced by syphilis. The adrenalin mesaortitis is confined to the aorta; the arteries elsewhere in the body show no alteration. Two theories have been advanced to explain the production of the aortic changes. According to the one view, the action is the result of the mechanical effect of high arterial tension, while the other view maintains that the changes are the result of a direct toxic action on the muscular fibres. Hedinger is rather inclined to favour the view that both these factors are associated in producing the changes. In one case, in particular, the media in the aorta showed evidence of increased pressure, apart from the actual atheromatous patches. Thus in the centre of the media, on staining with Weigert's method, a homogeneous line develops, which is seen to be due to the disappearance of the muscle fibres, and stretching and pressing together of the elastic fibres. It should be noted that Hedinger is the first to produce arterial changes from the subcutaneous use of suprarenal gland preparations.—*Cor.-Bl. f. schweiz. Aerzte,* Basel, 1905, October 15.

PROPHYLACTIC ACTION OF UROTROPIN IN SCARLET FEVER.

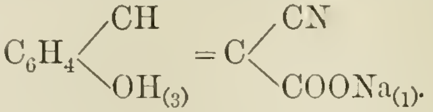
BUTTERSACK recommends the prolonged administration of urotropin as a prophylactic measure, to prevent the development of nephritis in scarlatina. As a rule, it is between the twenty-first and twenty-fifth day of the disease that the nephritis shows itself, and consequently previous writers have advocated the intermittent administration of urotropin, *e.g.*, from the first to the fourth, from the ninth to the twelfth, and from the seventeenth to the twentieth day of illness. But Buttersack, in view of the rapid elimination of urotropin, proposes that the administration should be continuous up to the twenty-first or twenty-fifth day. In a series of thirty-five cases treated on this plan, he has had no case of nephritis, though in isolated cases a trace of albumin suddenly appeared, with a few hyaline and epithelial casts and epithelial cells from the upper urinary tract, but without œdema or alteration in the appearance, quantity, or specific gravity of the urine.—*Med. Cor.-Bl. d. württemb. ärztl. Ver.,* Stuttgart, 1905, October 14.

THE VALUE OF GONOSAN IN THE TREATMENT OF GONORRHŒA.

SAAR has treated a number of cases of gonorrhœa with gonosan (a combination of Kawa resin and sandal-wood oil). Almost all previous writers have used gonosan in combination with local antiseptic treatment, and found that, under this combined form of treatment, the course of the disease is shortened, while complications are avoided, and the subjective symptoms (pain, erections, etc.) are diminished. In all, Saar has treated fifty cases with gonosan alone. As far as possible, the selected cases were fresh infections which had not received treatment. The drug was administered in doses of two capsules, three to five times in the day. The drug is well borne, and only occasionally caused slight gastric oppression, but this was never sufficiently marked to necessitate stopping the treatment. It is claimed that gonosan diminishes the burning pain and painful erections. Saar is able to confirm in some cases rapid lessening of the discharge, but he failed to notice any beneficial action on the erections, which remained unrelieved by the drug. On the whole, the action on the discharge is uncertain. In about 10 per cent. of the cases there developed signs of irritation, œdema of the glans and prepuce, etc., while, in no less than thirteen of the cases = 28 per cent., the inflammatory process extended to the posterior urethra, and in two cases epididymitis developed. Of special interest was the condition of the gonococci. The discharge was examined microscopically every second or third day. In six of the cases the gonococci disappeared entirely, but in the remaining cases the gonococci persisted after weeks of treatment, despite the fact that in many cases the discharge was reduced to a minimum. These findings are not encouraging. They show that gonosan is not a reliable method of treating gonorrhœa.—*München. med. Wchnschr.*, 1905, November 14.

Metaoxycyanocinnamate of Sodium, Zimphene.

Figuet describes the pharmacological action of this cinnamic acid derivative, the metaoxycyanocinnamate of sodium. The constitutional formula is—



$$C_6H_4\left\langle\begin{matrix}CH\\OH_{(3)}\end{matrix}\right. = C\left\langle\begin{matrix}CN\\COONa_{(1)}\end{matrix}\right..$$

He proposes the name of zimphene for this substance. It occurs as a yellowish-white body, crystallising in small polygonal crystals, soluble in water and weak alcohol. The odour is slightly aromatic, resembling vaguely that of the higher phenols. The taste is distinctly bitter, and causes an abundant flow of saliva. The drug produces no local irritant action, and causes no appreciable change in mucous membranes. It is not toxic, when given by the mouth, since several grams taken in a single dose do not produce any toxic effect. In animals, intraperitoneal injections of large quantities fail to produce serious disturbance, but intravenous injection causes death from the dissociation of the compound into gaseous elements. The therapeutic action of the drug is very marked. In doses of 7½ grs. it markedly stimulates glandular secretions. There is almost immediate increase of the salivary flow, and the gastric stimulation is shown by the production of eructations and the development of a ravenous appetite. The drug also exerts an action on the nervous system, since these effects in the glandular apparatus follow immediately the intraperitoneal injections. The action is not limited to the digestive glands, since all the glandular structures, liver, kidney, etc., are stimulated. The respiration is somewhat slowed, but the inspirations are fuller and more complete. In addition, the drug is antiseptic. After its absorption, phenol compounds appear in the urine. The compound decomposes in the intestine into metaoxybenzoic acid, which is absorbed, and non-toxic derivatives of hydrocyanic acid, which tend to augment the antiseptic action in the bowel. The antiseptic properties, combined with its powerful stimulating action on the gastric juice, make the drug useful in gastro-intestinal atony, and in the general treatment of dyspepsia. At the same time, it exerts a stimulant action in nutrition.—*Bull. Soc. d. thérap.*, Paris, 1905, November 22.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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Malta Fever.

Parts 1 and 2 of the Report of the Commission charged with the investigation into the causation and prevention of Mediterranean fever appeared in the summer of 1904. In August of the present year Part 3 appeared. The Commission was appointed by the Admiralty, the War Office, and the Civil Government of Malta, to act under the supervision of an advisory committee of the Royal Society, and has been the means of greatly extending our knowledge of this disease. The main results contained in Part 3 of the Report may be conveniently summarised under the following heads:—

The bacteriological examination of the blood, by Staff-Surgeon Shaw, R.N.—(1) *Micrococcus melitensis* is present in the peripheral blood in two out of every three cases (in 68 per cent. of a series of 103 cases). (2) It exists in the blood in relatively small amount. It is necessary to take at least 4 c.mm. of blood to show its presence. (3) The higher the temperature of the cases for a few days before and at the period when blood is extracted, the more likely is the latter to contain the germ. (4) The higher the agglutinating power of a blood during the fever, the larger is the minimal quantity of blood yielding the germ likely to be. A correlation is suggested between this and the patient's powers of resistance to the germ. (5) The smaller the minimal quantity of blood yielding the germ, the earlier is the latter likely to be obtained from the nutrient broth in which it is being incubated. (6) The germ is more likely to be present in blood abstracted in the late afternoon than in the forenoon. A correlation is suggested between this and usual evening rise of temperature. (7) No definite relation can be established between any chronological stage of the fever and the presence of the germ in the blood; it is present both early and late in the disease.

The infectivity of the skin, breath, and sweat.—The same observer concluded from his experiments that the germ was not given off by the skin, the breath, or the sweat.

The vitality of the germ outside the body.—The same observer tested its vitality in mixed broth cultures, in urine, and in various other states. In broth cultures, in presence of other organisms, it is recoverable for a very short time, one to two to seven days, contrasting greatly with its recoverability after at least four months in pure broth culture. In urine it retains its vitality a long time, as long as seven weeks. Agglutinins are also excreted by the urine. Controls were made between diluted healthy and diluted Mediterranean fever urines, with the result that the *Micrococcus melitensis* was recovered from diluted healthy urine for nine days, and from diluted Mediterranean fever urine for seventy-nine days. It was recovered from milk contaminated with healthy urine for three days, and from milk contaminated with Mediterranean fever urine for thirty-eight days. It was recovered from sterilised tap water for fifty days, from tank water for ten days, from potable water for seventy-two days, and from unsterile sea water for between eleven and forty days; from cloth contaminated with urine which had been allowed to dry on it, for from five to seventy-eight days; from cover slips on which an emulsion of the bacillus had been allowed to dry, after fifteen days, and in various soils after sixteen to ninety days. In the last cases the germ assumed the bacillary form which is generally regarded as less virulent than the micrococcal form.

This question of the excretion of the *Micrococcus melitensis* in urine, and its vitality therein, is of great practical importance. Captain Kennedy, R.A.M.C., found that the germ was excreted in the urine in two ways—(1) A sudden enormous gush which stops as suddenly as it appears; (2) a long-continued excretion of small quantities, and that it will retain its vitality thus excreted in the urine dried on cloth for seventeen days, and in dust for less than thirteen days, in sterile milk for sixteen days.

Goats as a means of Propagation of Malta Fever.—Several observations go to show that it is not only possible but probable that goats may convey the disease to human beings. Major Horrocks, R.A.M.C., investigated this question, and found that some of the goats in every herd examined suffered from Malta fever, that the *Micrococcus melitensis* is excreted in the milk in enormous numbers when the disease has been present sufficiently long to cause a change in the physical characters of the fluid. It is also excreted in considerable numbers even when the animals are in "full milk," and no changes have been observed in either the physical or chemical characters of the milk. It is also excreted in the urine of these animals, but only when the disease has existed for some time and physical changes have occurred in the milk. Dr. Zammit, in a preliminary investigation, has found that one or more apparently healthy goats in every herd are excreting the germ in their milk and urine, and that about 50 per cent. of the goats in Malta react to Malta fever when examined by the serum agglutination test. Does man acquire the disease by drinking this contaminated milk? No positive answer can yet be given to this question, but the results of feeding and inoculation experiments in monkeys make it a pretty safe assumption that he does.

Dysentery and Dysentery-like Organisms.

J. C. Torrey (*Journ. Exper. Med.*, N.Y., 1905, vol. vii. No. 4) has studied over 100 cultures from twenty-two cases of summer diarrhœa in infants, particularly in relation to their fermentative and agglutinative properties. It is claimed that bacilli resembling the dysentery organism may be recovered from most, even the mildest cases of summer diarrhœa in infants. More than 90 per cent. of the germs isolated split mannite with the production of acid. Taking the reaction in litmus milk as the most constant and typical, he divides the bacilli into two groups—(1)

Those producing a typical reaction in litmus milk, namely, the dysentery group; (2) those producing an atypical reaction in litmus milk, namely, a pseudo-dysentery group. The first group is a large and varied one. It may be divided, as is well known, into two main sub-groups, the "Shiga" or "Shiga-Kruse" and the mannite fermenters, which are of equal importance and entirely distinct. The latter group includes at least four distinct species, with a number of sub-varieties and transition forms. Two of the above species are found among organisms which split dextrose, mannite, and saccharose or maltose. The other two species are represented by the bacillus Y of Hiss and Russell and the "Flexner-Manila" bacillus. In contradistinction to the heterogeneity of the mannite fermenters, the homogeneity of the "Shiga-Kruse" type stands in marked contrast. Every culture of the latter which was tested (about twenty in all) reacted in all media, and agglutinated with all the various sera exactly alike. This diversity of the mannite fermenters may be due, as Flexner suggested, to their being occasional if not constant inhabitants of the normal intestine. This would explain many differences in fermentation and agglutination due to acquired adaptations to food remains, to mucus, to the contents of the intestinal tubules and the larger flask-shaped glands. The fact that dysentery bacilli have not been isolated frequently from the normal intestine might be explained by their habitat being possibly within the mucus tubules and their number few under normal conditions. When abnormal conditions arise and the production of mucus increases, these organisms may multiply and be enabled to attack any slight injury to the intestinal wall which might arise. The Shiga-Kruse group, on the other hand, is like a true parasite. Only an insignificant amount of agglutinin is present for it in normal human blood and that of laboratory animals, according to most authorities; it agglutinates alike in various immune serums; it has a very marked toxicity for laboratory animals; it has never been isolated from the normal human intestine; it produces no indol; it splits only the monosaccharids, through which it falls into line with the conclusions of Smith and Reagh, that the less a bacillus acts on sugars the more pronounced is its parasitic characters. It has never yet been found in the blood. The characters in which the true dysentery group resemble and differs from the pseudo-dysentery group may be summed up as follows:—(1) Characters in which they are identical—in morphology, in lack of motility, in not producing spores, in producing little or no pellicle in broth, in not clouding Hiss semi-solid medium, in not producing gas, in not liquefying any media, in producing a primary acidity in litmus milk followed by an alkaline reaction. (2) Characters by which the false are separated from the true—in a greater spreading on the surface of agar and gelatin, in producing a final acid reaction in litmus milk, in not absorbing any of the major or minor agglutinins for dysentery bacilli from the serum of animals immunised to any of the various groups of the dysentery bacillus, in not being at all pathogenic to rabbits, in failing to agglutinate in the blood of the individuals from whom they were isolated in the dilutions ordinarily employed. The points of resemblance indicate a general or family relationship which may be compared to that existing between the true and the pseudo-diphtheria bacillus groups, but the points of difference indicate that they must be regarded as distinct species. The pseudo forms may be, and perhaps in some cases have been, mistaken for true dysentery bacilli, but are probably devoid of active pathogenic properties.

EOSINOPHILIA.

Two papers on this interesting subject capable of easy summary have lately appeared (*Clin. and Path. Papers*, *Lakeside Hosp.*, Cleveland, Series 2, 1905). The first, by Weir, deals with eosinophilia in pelvic lesions and in the vermiform appendix, and the second, by W. T. Howard, jr., and R. G. Perkins, with the origin and occurrence of these cells in normal and pathological tissues. The results of the former are—(1) Eosinophiles take a prominent part in the cellular infiltrations associated with inflammatory and suppurative processes of the pelvic organs. (2) In such conditions they usually occur in the largest numbers in the sub-acute stage and associated with connective tissue hyperplasia. (3) They are found in great numbers in most cases of carcinoma of the cervix, and in almost all cases of pyosalpinx and ovarian abscess. (4) They occur in small numbers and in few cases of endometritis. (5) They form a large proportion of the cells forming the stroma of the mucosa in the normal and diseased appendix. (6) Their percentage in the circulating blood is usually decreased in inflammation of the pelvic organisms which show an eosinophilia. The results of the latter are very shortly as follows:—In 825 specimens removed by operation, eosinophiles were found in the normal appendix in ten cases and in the normal Fallopian tube in one case. They occurred in the tissues or blood vessels or both in 108 cases, particularly in those of infectious origin. In seven cases (one adult and the rest children), four of which died of infectious processes, eosinophiles were present in apparently normal organs. In 120 consecutive autopsies, twenty-seven cases showed larger or smaller numbers in various organs showing pathological changes. As to their origin, it is held that they were either brought by the blood (being preformed in the bone marrow from the eosinophile myelocytes) or produced *in situ* from the plasma cells or the hyaline leucocytes. Other methods of origin, such as development from other forms of leucocytes, are not supported, though they are not denied.

DERMATOLOGY.

UNDER THE CHARGE OF

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THE X-RAY TREATMENT OF SYCOSIS SIMPLEX.

THE success of this method of dealing with a most obstinate disease has now been fully established, but histological observations are still scanty, thus the report of the following carefully noted case is of value. Scherber (*Dermat. Ztschr.*, Berlin, 1905, July) removed from an example of frequently recurring sycosis portions of skin before and after exposure, the same region being selected, and in the second series the biopsy was carried out at the height of the strongest reaction. Previous to treatment there was marked inflammatory hyperæmia and abundant round cell infiltration of the tissues, in parts even proceeding to abscess formation. The diseased areas were bright red, and exhibited marked afflux of blood, which flowed rapidly through the vessels. After the exposures, this active hyperæmia was replaced by well-marked passive congestion, shown objectively by a dusky livid red coloration of the surface and free venous oozing on excision. Under the microscope the congestion found its anatomical explanation in the relaxation of the very œdematous vessel walls, leading to a lowering of their tone, passive dilatation, and slowing of the blood stream. The prime causal element in the retrogression of the disease under the influence of the X-rays, must be attributed to the rapid disappearance of the micro-organisms which occasioned it. Although previous observations do not favour the view of a direct bactericidal action on the tissues, yet the intense local reaction on the hair-sheaths and papillæ come into consideration, as on these and their cell elements an almost specific effect is produced, and thus infection is checked. Thus, in this chief seat of invasion the conditions of life of the organisms are certainly impaired, while the mere mechanical loosening and falling out of the hairs plays an additional part. Besides, we must take into view the existing lymph and blood stasis, promoting the absorption of the cell elements, a stasis which acts analogously to Bier's congestive method, and apart from the automatic effect of vascular constriction, a direct or indirect (through toxic substances) action of the rays on the constituents of the vascular walls is to be reckoned with. Thereby there develops congestion of the whole tissue with pronounced œdema, persisting in duration far beyond the passive hyperæmia which succeeds to the active.

The Etiology of Infantile Eczema.

Dr. Arthur J. Hall's careful researches into this subject are calculated to dispose of some unfounded opinions, and to throw considerable light on an obscure topic. (*Brit. Journ. Dermat.*, London, 1905, May, June, July, August.) His statistics and conclusions are based on the study of sixty consecutive and unselected cases, in which the period of the onset of the disease was restricted to a commencement in the first year of life. There are, broadly, three groups of alleged causes—(1) The theory of digestive disturbances, with various subdivisions. The evidence afforded by the cases is insufficient to give colour to the view that this or malassimilation can be blamed. Various cogent reasons are cited, and this hypothesis, however plausible, may be dismissed as untenable. (2) Vaccination, dentition, diathesis, heredity, etc. All these as direct causes may also be set aside, for considerations fully stated. (3) The theory of external irritation. He believes that, as in adult life, the conditions to which individuals are exposed lead to the production in many persons of what we term an "occupation or traumatic eczema," so many, possibly most cases of infantile eczema are, so to speak, the "occupation eczema of infancy," and that they usually get well when the occupation (in this case it is that of being an infant) is given up, namely, in the course of the second or third year, sooner if efficiently treated, but usually whether treated or not. There are at least six external conditions which make up this "occupation of infancy" which are more or less constantly present. They are—(*a*) Chill to the skin (sudden changes of temperature); (*b*) imperfect drying; (*c*) soaps; (*d*) irritating dust in atmosphere; (*e*) micro-organisms; (*f*) sweat of mother's skin. *As regards its skin*, the infant at birth changes from a subtropical aquatic existence to a terrestrial life in a temperate zone. It starts with some entirely new external conditions, which may or may not suit its skin, and, during its first six months of life, it has little or no power of localising or removing any of those irritants. For instance, when it is washed, it cannot point out whether subsequently it is thoroughly dried or not. Again, its skin possesses more reflex irritability or hypersensitiveness than does that of the adult, as a rule. In familiar language we say that a child is "ticklish." The most striking reason for suspecting that such external irritants are, some or all of them, the cause, is the fact that in 95 per cent. of the cases the rash first showed itself in practically the only exposed part of the whole infant, namely, the head or face, the rest of the surface during the first month being swathed and protected at every point. Of these six classes of irritants, there is a likelihood of some or all of them acting together, though in certain instances one or more may predominate. Thus there is evidence that the bulk of the cases begin in the colder periods of the year, and therefore he is disposed to attach the greatest importance to cold as the predominating irritant. This will undoubtedly also influence any imperfect drying of the skin after washing. We are all familiar with the readiness with which persons get chapped hands in winter if they have to wash frequently, and especially if they fail to dry their hands carefully, and there is no reason to see why the infant should not get repeated and very effectual irritation from what may be termed chapped face. If to that be added an irritating soap, such as is so frequently employed by all classes, we have a combination of very powerful irritants. And one can readily see why this is more likely to affect the face than the rest of the body in a young infant; because, after the general bath, in which the same soap, the same water, and the same inefficient drying may be used, the body and limbs are at once covered with clothes, so that moisture is absorbed and the clothes prevent evaporation or the contact of cold air with the newly washed surface. In the case of the face this is not so Then again, the child's face is the only part which is freely exposed when the child is taken out, or, in the cottages of the poor, with the room door opening on to the street, when it is near the door in that room. How far irritating particles, such as smuts, etc., in the atmosphere, help with the other irritants it is difficult to say; but inasmuch as they tend to soil the face, and consequently increase the vigour and frequency of washing, it is quite possible that they may do so indirectly. Micro-organisms probably only play a secondary part in infantile eczema, even when the start may be from a seborrhœic dermatitis; the latter, indeed, is not infrequently grafted on the former. Lastly, it is possible that the irritation may be initiated by the mother's sweat, because the child is repeatedly in contact with the mother's warm breast when suckling, and the seat of commencement is so frequently the cheek, which would during these times be exposed to such irritation. It may be suggested, therefore, that what is generally called eczema, whether it occur in infants or adults, is a form of reaction or response of the neuro-cutaneous apparatus to external irritation.

Therapeutic Notes.

Affections of the nails are notoriously obstinate and difficult to treat. After a whitlow, the nail is usually cast off, and, becoming loosened from its bed, the rough edge catches on woollen or other loose textures and gives rise to unpleasant sensations. Porosz (*Monatsh. f. prakt. Dermat.*, Hamburg, 1905, August 1) has devised a simple plan of obviating the discomfort. He fills with collodion the space between the new nail and the lower part of the separating old one, avoiding the skin at the sides. When this dries a firm union occurs, which completely protects the finger-tip, and at the same time does not hinder the growth of the new nail. The application of the collodion is no doubt accompanied with some smarting, but on the subsidence of this the tenderness of the part disappears simultaneously. Dreuw of Hamburg (*ibid.*, 1905, September 15) finds in euguform an acetylic condensation product of guaiacol and formaldehyde, a valuable addition to our applications after cauterisation in lupus. Euguform is an almost odourless, bright yellow powder, insoluble in water, dilute acids or alkaline carbonates, but readily dissolved in acetone. It breaks up into its constituents in presence of the moist tissues, but is apparently non-toxic. In lupus, after any treatment which occasions ulceration or necrosis, it may be dusted on or applied as a paste—℞ Euguform, 4; zinci oxidi, 6; terr. silic., 2; adep. benzoat., 28; *M.* Fiat pasta. The secretion and pus formation soon cease, and the surface is placed in a very favourable condition for further treatment. In callous ulcers of the leg, the following sequence brings about rapid epithelisation: Freezing, cauterisation with hydrochloric acid, then euguform. Or without cauterisation it can be used with benefit. The ulcer is dusted well with euguform, a piece of silk protective placed on, then a bandage painted over with zinc glycerine jelly is put on, and in some cases a second. In a later stage a 5 to 10 per cent. euguform paste suits well. *The treatment of xanthoma of the neighbourhood of the eyelids* has hitherto proved unsatisfactory, but if the experience of C. W. Allan (*Med. Rec.*, N.Y., 1905, September 23) be confirmed, an easy method of dealing with this disfigurement has been discovered. He states that several years ago he found in the high frequency spark a practical, prompt, satisfactory, and hardly painful mode of cure. He employs a static machine and a hyperstatic transformer, a large carbon electrode, a spark gap of 2 in., and a contact spark of about $\frac{1}{8}$ in. He uses this also in the treatment of yellowish-white spots on the mucous membrane of the lips and oral cavity, originally described by Fordyce in 1896. For this two or three sittings usually suffice. The spark should cause almost at once marked whitening.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

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Acute Leukæmia in Early Life.

The following is a brief abstract of the conclusions arrived at by Churchill in a valuable paper on "Acute Leukæmia in Early Life" (*Trans. Am. Pediat. Soc.*, Phila., vol. xvi. p. 193). All cases of leukæmia are myelogenous in origin. As in adults, the acute variety is more apt to be of the lymphatic type. The disease is rare in early as in later life. It is, however, more common than has been supposed, twenty-two cases of the acute or sub-acute variety having been reported since 1898, while previous to that date only seven cases are on record. The organs and tissues generally are infiltrated with lymphadenoid cells, closely resembling the small mononuclear lymphocytes to be seen in the blood during life, showing the widespread distribution of these elements. The involvement of the bone-marrow is confirmatory of the views of Neumann and others, that no case of leukæmia, thoroughly studied, has failed to show an abnormal condition of this structure. The change is undoubtedly the result of a chemiotactic agent acting upon the bone-marrow, the clinical manifestations and type of the disease depending on the nature of the chemiotactic agent, but of the real nature of its action we know nothing. There seems to be nothing in the family or previous history which can be regarded as predisposing to the disease. As to direct heredity, there have been recorded only two cases of the condition occurring in both parent and child, too few from which to draw any conclusions. As with heredity, so with the previous history of the cases, nothing appears to act as a predisposing cause, except, possibly, chronic tonsillitis. It is not probable from the data available that tubercle plays a part, either direct or indirect, in the causation of the condition. Susmann, studying the relation of leukæmia and tubercle, even concludes that a certain antagonism exists between the two conditions. No age is exempt, leukæmia having been observed in the new-born child and as late in life as seventy-one years. The onset may be sudden, but more often is insidious, with vague indefinite symptoms, which gradually develop into the typical leukæmia picture. The general course of the disease in children, on the whole, is the same as in adults, and is always fatal. It occurs more frequently in males. The spleen is enlarged in all cases, and the liver generally, though the enlargement is, as a rule, not very great. General glandular enlargement is not constant, the cervical glands being those most frequently affected. The duration of the condition varies from a few days to five months. As in the adult, the chief interest in leukæmia centres in the blood. There is a diminution in the hæmoglobin and in erythrocytes. The lowest red count recorded after several hæmorrhages is 750,000. The leucocyte counts range from 6000 to 810,000. The differential count shows that out of twenty-nine cases twenty-five were of the lymphocytic type, one myelocytic, two of the mixed cell variety, and one case undetermined. The lymphocytosis, furthermore, is more apt to be of the small-celled variety. The polymorphonuclears are always reduced, often to an extreme degree. Except in the myelocytic and mixed cases, myelocytes are rarely present, and then only in small numbers. Nucleated reds are also rare, though found occasionally. The course in children differs from the adult type only in minor details; hæmorrhages are fewer and less severe, and the lymphocytosis more apt to be of the small variety. Abnormal appearances are found post-mortem in practically all the tissues and organs of the body, consisting of excessive infiltration of the tissues with small mononuclear lymphoid cells, identical in appearance with the small lymphocyte with which during life the blood is flooded. Treatment is of no avail. Arsenic is generally given, but is useless. Treatment by means of X-rays gives no promise of permanent help. Injections of antistreptococcic and antipneumococcic sera have been suggested.

Brachial Birth Palsy.

In an interesting paper on this subject, the authors, Drs. Clark, Taylor, and Prout, give an exhaustive account of the history, etiology, pathology, and treatment of this condition (*Am. Journ. Med. Sc.*, Phila., 1905, October, p. 670). Many new facts are embodied in this research, concerning the causation and pathology of the laceration type of birth palsy, of which the following is a brief summary:—

1. The cause of the laceration type is tension on the nerve trunks, which first ruptures the nerve sheaths and then the nerve fibres. The prevention of this serious lesion of the cervical nerve trunks rests with the obstetrician, who should not over-stretch the child's neck in the process of delivery.

2. The persistence of the palsy is clearly explained by the pathological findings, namely—(*a*) Rupture of the perineural sheath with hæmorrhage into its substance, resulting in the formation of hæmatoma or hæmatomatous infiltration of the neighbouring tissues; (*b*) the cicatricial contractions following organisation of the blood clot and repair of the rent in the perineural sheath. The connective tissue formed indents and presses on the nerve bundles, strangulating them, and preventing regeneration of the nerve fibres. In some instances the same result is accomplished by the turning inwards of the perineural sheath on the nerve bundles.

3. The nature of the lesions in all cases demands excision of the damaged areas, and suture of the divided ends as soon as it is proven that spontaneous repair will not take place. The plan of treatment is then the same as that for peripheral nerve injuries elsewhere.

4. In all cases such treatment as will prevent contractions or deformities and maintain muscle tone in the paralysed limb should be systematically used, until either spontaneous recovery occur, or operation is done (traumatic neuritis is a contra-indication to active treatment). It is obvious that the above measures should be continued after operation.

5. The proper time for surgical interference is not yet definitely

fixed. It appears, however, to be much later than two or three months after birth, as advised in Kennedy's report. At the present time, one year would seem to be a reasonable delay before operation.

6. Sufficient time has not elapsed in the majority of the seven cases quoted in detail for final results to have appeared. At the age of eighteen months, in two cases the improvement in nutrition, range of motion, and muscle power in the paralysed limb, were sufficient to demonstrate the value of the operative procedure.

Infantile and Juvenile Tabes.

The existence of true tabes dorsalis in children has been doubted by many authorities, and nearly all agreed as to its extreme rarity. Hirtz and Lemaire, the authors of the paper under review, record forty-seven cases in which they consider the diagnosis of infantile tabes to be beyond question, thus differing from Ormerod, who says that if we exclude cases of Friedreich's hereditary ataxia, the disease is practically unknown. Hirtz and Lemaire maintain, on the other hand, that it is almost impossible to avoid the diagnosis of tabes when we have a symptom complex of urinary incontinence, loss of knee-jerks, viscera crises, lightning pains, and disturbances of sensation. They, however, admit that pupillary troubles, loss of tendon reflex, and lymphocytosis of the cerebro-spinal fluid are equally characteristic of nervous syphilis as of tabes.

The most constant functional disturbance of the pre-ataxic period of juvenile tabes is incontinence of urine. It occurs in about half the cases, and is very much more frequent than in the adult. Lightning pains, on the other hand, are a frequent mode of incidence in the adult, whereas they are relatively rare in the child. In 14 per cent. of the cases, amblyopia was the symptom for which the child was first brought under observation.

Inco-ordination is always slight, and has generally to be sought for, whilst, on the other hand, the loss of the patellar and Achilles tendon reflexes is so well marked that the authors refuse to recognise a case as tabes in which these reflexes are present. Derangement of the objective sensations, such as anæsthesia and paræsthesia, are the most important functional symptoms of juvenile tabes. The syphilitic origin of the disease is insisted upon, with the obvious qualification that the syphilis is inherited in such cases. One of the cases quoted bears this out in a remarkable degree. The subject of undoubted congenital syphilis, he was attacked with gastric crises at the age of six years. He was still under observation when twenty-three years old, when he exhibited, in addition to the gastric crises, the Argyll-Robertson pupil, loss of knee-jerks, and a spontaneous fracture of the os calcis. The disease progresses exceedingly slowly in young subjects.

The authors conclude by pointing out that tabes is an uncommon manifestation of hereditary syphilis, the usual one being a diffuse inflammation of the cord and membranes, and that the spinal cord of the child seems to offer a special resistance to degeneration of the posterior columns.—*Presse méd.*, Paris, 1905, No. 40.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Medico-Chirurgical Society.—*December* 6, 1905.—Dr. Affleck, President, in the chair.

Specimens were shown by Drs. W. T. Ritchie, Bruce, M'Donald, and Pirie; and by Messrs. Charles W. Cathcart, E. S. Carmichael, David Wallace, Caird, and Alexis Thomson.—Mr. C. W. Cathcart showed—(1) A case of congenital dislocation of the hip after treatment; (2) a case of patella twice sutured for fracture.—Dr. Byrom Bramwell showed—(1) A case of multiple lipomata, in which the condition seemed to be hereditary; (2) a case of ataxia without any apparent impairment of the sense of movement (muscular sense).—Mr. E. S. Carmichael showed a child, æt. 14 months, after resection of the cæcum, ascending colon, 4 in. of small intestine, and a mass of ileo-cæcal glands, for tuberculous disease.—Mr. Wallace showed two patients after prostatectomy by the suprapubic route.—Mr. Caird showed—(1) A patient after recovery from tetanus; (2) a patient after recovery from perforating duodenal ulcer; (3) a patient after recovery from perforating gastric ulcer.—Dr. Aitchison Robertson gave a demonstration of Uhlenhuth's serum test for the recognition of human blood.—Mr. George G. Hamilton (Liverpool) read a paper on the treatment of fractured patellæ by transverse wiring. The treatment by rest means that eighteen months must elapse before the patient is fit for work. The open method is advocated partly because it enables the cure to be effected in a much shorter time, and partly because it enables the surgeon to clear all the blood clot out of the joint, and so do away with the chief cause of stiffness. With careful aseptic precautions, the operation is a very safe one. A mechanical drill is used for boring the two fragments, and a medium silver wire is used in preference to catgut or silk. As a rule, the splint is off in ten days, and the patient allowed to move the joint. The paper was illustrated by several X-ray photographs of cases operated on by Mr. Hamilton. — Dr. William Russell read a paper entitled "The Relation of Angina Pectoris and allied Conditions to a Vasculo-cardiac Reflex having its Origin in the Abdomen." An account was first given of the various views held as to the pathology of angina. The differences of opinion as to its nature are due to the fact that angina, like dropsy, is a symptom of different pathological changes. It is always due to a sudden embarrassment of the myocardium. Thus a general arterial spasm produces it by the sudden strain thrown on the heart, or there may be a sudden anæmia of the heart because of contraction of the coronary arteries. The taking of food into the stomach is followed by a great influx of blood into the splanchnic area. This is followed by a reflex contraction of the systemic arteries (hypertonus). The degree of contraction depends on the nature of the food: a large meal and stimulating food produce a marked contraction. Sclerosed vessels are particularly sensitive to hypertonic contraction, and thus it is that the slightest error in diet will in such cases produce anginal attacks. Dr. Russell related some cases in which anginal attacks occurred frequently, even though the patients were taking the remedies usually prescribed. An alteration in the diet to one of a less stimulating character was at once followed by a marked improvement. In cases of angina major, when there are grave anatomical changes associated with the spasm, no cure can be looked for but only amelioration of the symptoms. In angina minor, on the other hand, there is no anatomical change, and a cure may be expected.

Edinburgh Medico-Chirurgical Society. — Clinical Meeting in Royal Infirmary.—*December* 20, 1905.—Dr. J. O. Affleck, President, in the chair.—Dr. Norman Walker showed—(1) A case of mycosis fungoides; (2) a case of ringworm treated by X-rays.—Dr. Allan Jamieson showed a case of multiple adenomata of the sebaceous glands. —Dr. Logan Turner and Mr. Alexis Thomson showed a man after total extirpation of the larynx for malignant disease.—Sir Thomas Fraser showed—(1) Two cases of peripheral neuritis, the one caused by arsenic administered for chorea, the other by over-indulgence in tobacco; (2) three cases of morbus cæruleus: (3) a case of urticaria a frigore.—Mr. C. W. Cathcart showed a patient after operation for abscess of the liver containing gall stones.—Mr. Alexis Thomson showed—(1) A patient illustrating the effect of Ball's operation for pruritus ani; (2) a patient, æt. 35, nine months after removal of cæcum and glands for cancer; (3) a patient, æt. 31, after resection of the pyloric segment of the stomach for cancer.—Mr. Scot Skirving showed—(1) A patient after prostatectomy by Freyer's method; (2) a boy after operation for acute obstruction due to tuberculous stricture, with later ileo-colic anastomosis; (3) a man with dislocation of both ends of the clavicle.—Dr. James showed—(1) A case of epidemic cerebro-spinal meningitis; (2) a case of sprue; (3) a case of Malta fever; (4) charts from a case of pneumonia intercurrent in diabetes mellitus.—Mr. Caird showed—(1) A case of coxa vara; (2) a patient after nephrectomy for renal calculus; (3) a case after removal of large intra-abdominal lipoma; (4) two patients after operation for rectal carcinoma.—Mr. George Chiene showed—(1) A child after transplantation of tendons for deformity due to infantile paralysis; (2) a patient showing result of operation for cleft palate in an adult; (3) a patient after operation for ruptured gastric ulcer and acute general peritonitis.—Mr. Cotterill showed—(1) Two cases of exophthalmic goitre after operation; (2) a case of stricture of the œsophagus after intubation; (3) a case of symmetrical enlargement of the fingers and toes.

Edinburgh Obstetrical Society, *December* 13, 1905.—Dr. J. W. Ballantyne, President, in the chair.

Specimens were shown by Drs. N. T. Brewis, Haig Ferguson, Lamond Lackie, and by the President.—Dr. Barbour Simpson read a paper on "Pudendal Myxoma." He described a case which had been under his care that seemed to be one of primary myxoma, a very rare condition. He referred to the literature of the subject, and pointed out that many authorities believed all cases to be secondary to another form of new growth. Dr. Simpson showed photographs, and described the microscopic appearances.—The President read a paper on "The Delivery of the Hydrocephalic Infant by Spinal Tapping—a second Case." He referred to the case he had reported a year ago, and described in detail this second case, which he had had recently. The patient was a 4-parous woman, who had had a dead-born premature female infant, an anencephalic female fœtus, a living male infant, and a hydrocephalic female fœtus. The presentation of this last was by the breech, and the head was delayed above the pelvic brim. Spinal tapping was performed through the aperture of a lumbar spina bifida with immediate delivery of the infant. The mother made a good recovery. The past history of this patient was referred to, and the tendency to recurrent monstriparity in some families was noted.

Glasgow Pathological and Clinical Society.—*December* 11, 1905. —Professor Muir in the chair.—Dr. Alfred A. Young showed—(1) A young man, æt. 23, with a large and slightly ulcerated cancerous tumour of the scalp, with secondary nodules around it, and with enlarged and hard lymphatic glands behind the ear and along the border of the sterno-mastoid muscle. A small tumour, which was supposed to be a wen, was removed in the beginning of the year, but the wound never healed satisfactorily. Six months ago a fungating mass was removed, and shortly afterwards hard nodules appeared in the scar and in the neck, and grew rapidly. The microscopic characters of the tumour resembled a rodent ulcer, but the cells were of larger size, and appeared to be derived from the deeper layers of the skin or from the hair follicles. (2) A microscopical specimen of a small-celled cancerous tumour, which appeared within a few weeks of healing in the scar of an empyema wound. (3) A melanotic sarcoma arising from a pigmented mole in the skin of the forearm, together with the infected axillary glands.—Dr. T. K. Monro read notes of a case of subacute spinal muscular atrophy. The patient was a man, æt. 56, who had been in failing health for about a year. On admission, he suffered from loss of power in his legs, want of control over bladder and rectum, and marked atrophy of the muscles of the lower limbs, loss of knee reflexes without loss of sensation. The power of the upper limbs was diminished but by no means lost. The illness was of a progressive character, and after three months' residence terminated in a low form of pneumonia.—The changes in the spinal cord were investigated by Dr. J. W. Findlay, who showed a number of sections. The chief features were a great scarcity of the motor nerve cells in the lumbar and sacral segments; a number of the remaining ganglionic cells showed degenerative changes, the anterior nerve roots in the same regions showed marked atrophy, and there were evidences of degeneration in the pyramidal tracts. The muscles of the thigh showed practically complete replacement of the muscle fibres by fatty and connective tissue.—Dr. J. Stoddart Barr read notes of a fatal case of septic thrombosis of the lateral sinus secondary to chronic purulent otitis media, and complicated by septic infarctions in the lung.—Dr. Logan Taylor gave a description of the spirochæte pallida, and exhibited microscopical preparations.

Glasgow Medico-Chirurgical Society.—*December* 15, 1905.—Dr. J. H. Nicoll showed—(*a*) Several patients from a further series of cases of congenital obstruction of the pylorus treated by operation; (*b*) several prostates recently removed by operation. Dr. Nicoll submitted considerations based on an experience of 100 cases of prostatectomy.—Dr. G. B. Buchanan read—(*a*) Notes on a case of death from acute ascending paraplegia (Landry's paralysis) occurring in a patient suffering from prostatic hypertrophy complicated by pyuria and enlargement of both kidneys; (*b*) a short paper on scopolamine-morphine anæsthesia, with notes on a few cases.

Forfarshire Medical Association. — *December* 7, 1905. — Dr. Sinclair, President, in the chair.—Dr. R. C. Buist exhibited two specimens of cancer of the uterus, with disease of the appendages.—Dr. George Whyte described a case of belladonna poisoning. A few months ago he was called to an urgent case, and found a woman delirious, excited, and talkative. She complained of dryness of throat and mouth; pupils were dilated, and did not react to light. Three days previously, for the relief of a pain in her back, she had applied a porous plaster. This caused very great skin irritation, and scratching in the neighbourhood of the plaster had allowed of rapid absorption of the incorporated material, evidently belladonna. Immediate removal of the plaster, and the administration of $\frac{1}{6}$ gr. of morphine, repeated at intervals, gave complete relief.—Dr. J. Mackie Whyte reported an unusual case of suppurative hepatitis. The patient, a man 65 years of age, was admitted to the Royal Infirmary after an illness of three weeks' duration, which began with a chill, and was followed by frequent attacks of shivering. His previous history was uneventful. He was a stout, well-nourished man. During the nine days he was in hospital he had eighteen rigors, occurring at irregular intervals, and lasting from fifteen to twenty minutes, and on one occasion as long as fifty minutes. The temperature ranged from 96° F. to 106° F. He became delirious after the rigors, and had incontinence of urine and fæces. The liver was not tender or enlarged, but a slight jaundice developed shortly before death. Examination of the blood did not reveal the presence of organisms. The symptoms clearly indicated a suppurative condition, but the absence of distinctive signs made it difficult to locate the exact site, until the jaundice, when it was too late, pointed to the liver. He died from exhaustion. The abdominal cavity contained a few ounces of dark, muddy, bad-smelling fluid. In the region of the sigmoid flexure was observed a small tumour, which on closer inspection was seen to be composed of a mass of inflammatory material surrounding a small diverticulum from the bowel. In this there was a fæcal concretion, which had set up the inflammatory process, causing a local peritonitis. The diverticulum was perforated in two places, and adhesions had formed with the surrounding parts, the condition being best described as "diverticulitis." The liver weighed 4 lb. 7 oz., was of dark slate colour, and very soft. It was studded all over with small abscesses, the left lobe being more affected than the right. It was thus evident that the liver had been infected from the "diverticulitis" through the portal circulation, a condition of portal pyæmia having existed. This, of course, accounted for the negative examination of the blood, the liver having acted as a barrier to the passage of pyogenetic organisms into the general circulation.—Dr. Halley read notes upon two cases of sciatica, which he had treated by isolating from adhesions and stretching the sciatic, internal popliteal, and posterior tibial nerves, with excellent results.

ANALYTICAL REPORTS.

Milo Food.

(Henri Nestlé & Co.)

This food has recently been introduced by Messrs. Nestlé, of condensed milk fame. Unlike the majority of the infant and invalid foods on the market, it is chiefly composed of milk, reduced by evaporation to a fine white powder. A little starch, in the form of powdered wheaten biscuit, is added; and though starch is quite incapable of digestion by infants, the small quantity present does not appear to do any harm. It serves, on the other hand, a very useful purpose in rendering the curd formed in the stomach less dense and more akin to the curd formed from human milk. The food is put up in sealed tins, and is quite sterilised. We have had the food on trial for several months, and can with confidence speak very highly of its excellent qualities. It is easily prepared, very palatable, and children who are unfortunately deprived of that best of all infants' foods, mother's milk, take very well to this valuable substitute. Among the many infants' foods on the market, Messrs. Nestlé's Milo Food will take a deservedly high place.

Styptol.

(Knoll & Co., London.)

Styptol is the neutral phthalic acid salt of cotarnine. The hæmostatic action of cotarnine is well known: it has been sufficiently demonstrated in the action of stypticine, which is the hydrochloride of cotarnine. It has recently been shown that phthalic acid also has a hæmostatic action, and thus in styptol we have a combination of two hæmostatics. Styptol is a yellow crystalline powder readily soluble in water, and it has been given over fairly long periods without giving rise to any toxic symptoms, comparing very favourably in this respect with ergot. In addition to its hæmostatic action, styptol has a simultaneous sedative action, which is frequently of great advantage, *e.g.*, in cases of dysmenorrhœa. It has been used in arresting uterine hæmorrhage, from whatever cause arising, but more particularly in cases of menorrhagia. In all such cases there was marked improvement. It has also been used in cases of bleeding from myomata and cancerous growths with good effect. It is also worthy of note that styptol may be safely used for hæmorrhage during pregnancy, unlike stypticine, which is contra-indicated in such cases, since it occasionally gives rise to pains. The remedy has been fully tested by German physicians; and we are pleased to be able to confirm, as far as our experience of it goes, the favourable opinion as to its value which has been arrived at by these observers.

VIROL.

(Virol Limited, London.)

THIS well-known preparation has now been before the public and the profession for several years, and right well has it stood the best of all tests — the test of time. It is now much more extensively employed than ever, and the fact that it is used in so many hospitals speaks volumes on its behalf. Virol contains no cod-liver oil; but the absence of this valuable substance is apparently no drawback, for virol contains a sufficiency of fat-forming foods in a readily assimilable form. It is chiefly composed of bone marrow, malt extract, and yolk of eggs. Its agreeable taste makes it pre-eminently suitable for administration to children. We have used it for several years, in cases of malnutrition of children, with excellent results. In convalescence after such diseases as measles, whooping-cough, and broncho-pneumonia, virol is very valuable, and restores health and strength with remarkable rapidity. The great drawback to the administration of cod-liver oil is its tendency to "repeat," and to disturb the digestion of the patient. This objection does not apply to virol. We have yet to meet the patient who dislikes its taste, or whose digestion is in any way disturbed by it. Virol is thus an excellent substitute for cod-liver oil in the many cases where the administration of that invaluable remedy is contra-indicated.

HYDROXYL-FREE COD-LIVER OIL (MÖLLER).

(Peter Möller Ltd., 18 High Holborn, London.)

CHIEFLY through the researches of Heyderdahl, it has been shown that the nauseous eructations which frequently occur after the ingestion of cod-liver oil are due to the presence in the oil of hydroxylated compounds which irritate the gastric mucous membrane, producing the distressing symptoms above referred to. It has also been proved that these hydroxyl bodies are present in oil which during its manufacture has been exposed to the atmospheric air. By substituting an atmosphere of carbonic acid gas, an oil is obtained which is quite free from these objectionable bodies. In the manufacture of Möller's cod-liver oil, this is successfully accomplished, as, from the moment the oil leaves the liver cells until it is bottled, corked, and sealed, the whole process is conducted under an atmosphere of carbonic acid gas. We can personally vouch for its freedom from objectionable taste, and that it is entirely free from unpleasant after-effects.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

Professor Osler's Message.[1]

One of the highest tributes which fashion pays to the successful author is to demand a volume of selections from his writings. At the worst, it no more than proves that he enjoys a certain vogue; at the best, it epitomises his teachings, and brings them—i's dotted and t's crossed—to the knowledge of many who from lack of opportunity, or perhaps from mental inertia, would otherwise remain ignorant of them. The student, and Dr. Osler's student most of all, will always shun abridgments; for him, only his master's whole work, not a comma less, will serve, and Dr. Camac acknowledges this in hoping that his readers will turn from his pages to the originals. Since Dr. Osler came to Oxford we have been told by Baltimore men that it was not the physician they grudged us, but the man. Even Johns Hopkins (they said), which will wait for years to fill a chair if the right man cannot be found sooner, will easily get a new teacher of medicine, but we shall never have another Osler. And part of the reason is made plain by this volume, in which the Man, not the Professor, speaks. Ask any old pupil about Dr. Osler—you will hear little of his scientific attainments, much about his character and influence: the former are known to the world, the latter only to a few. To let us breathe the atmosphere which made Baltimore a seat of learning, not merely a centre of knowledge, is Dr. Camac's object in selecting from his old chief's addresses these *Counsels and Ideals*; the object is fulfilled in so far as the written word can replace the living utterance.

Men will read *Counsels and Ideals* for two reasons: first, for what they teach; second, because they afford more than a glimpse of the writer himself, and to many, if not most, the revelation of a great personality will be their lasting charm. Much good advice these pages hold, and much wisdom, and not a little lore (how many know, for instance, that Thomas Dover, prescribing his powders to patients at the Jerusalem Coffee-House in the Strand, was in his more serious moments a buccaneer, third in command of the privateers *Duke* and *Duchess* sailing out of Bristol town, and the discoverer of Alexander Selkirk, immortalised by Defoe ?). To select from a selection is to give a poor idea of its contents; better attempt to depict one general impression snatched from its pages. To men of commoner mould, any calling, and it may be rat-catching or conveyancing just as well as medicine, pursued with sufficient assiduity, at first for gain, then from habit, may ultimately yield complete and all-sufficing intellectual satisfaction, life's potentialities being narrowed down to what touches trade requirements. Again, to many, more imaginative and liberal, let us say, if less tenacious in effort, medicine as a pursuit seems to come in contact with only a part of life, in other aspects of which a field for mental discipline, for sympathies to be gratified, or for pleasure, is sought. To read Dr. Osler's words (and he is ever a persuasive pleader) is to find a reconciliation, and to realise that the practice of medicine may be made coextensive with almost the whole of life's interests and activities, and this from no restriction of these, but from a widening of the scope of the physician's art, and even more from the ever-growing culture and sympathy which each year of practice brings. Conduct has been reckoned as three-fourths of life, and whether Dr. Osler is speaking as biographer or historian, of Chauvinism in medicine, of travel, or what not, right conduct is ever his aim, and if the practice of medicine—inseparable from conduct, involves as much as three-quarters of the art of living, surely its science and practice together may satisfy nearly all the mental and moral faculties of even the most highly gifted. *Counsels and Ideals*, at least, gives a hint as to the path leading to the realisation of this.

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[1] "Counsels and Ideals from the Writings of William Osler." By C. N. B. Camac. Oxford, 1905.

To dwell on the personality revealed in these pages savours of impertinence; but one thought they aroused may be permitted us. Dr. Osler mentions some of the writers who have influenced him, and it is easy to guess at others. In mental equipment and outlook he recalls one whom he not unfrequently quotes—Matthew Arnold. In both we find the same catholicity and Hellenic spirit, the same high culture—"the study and pursuit of perfection," the same candid examination of authority, and that same touch of the apostle without which a man appeals to his fellows in vain, sing he never so sweetly. On lower ground the two agree in love of letters and distinction of style. But Dr. Osler is ever an optimist; an actor as well as a thinker; when he smites he does so reluctantly, and irony, if in his armoury, hangs rusted on the wall. To speak ill of no man is a duty, he tells us, and none save words of charity flow from his pen.

For such a message to his brethren, no time could be more fitting than now, when Professor Osler has turned his face from the occident to the orient, from the setting to the rising sun, and has come back to the country which, despite all efforts to think imperially, we still most venerate as the cradle of our race.

Hereditary Ataxia. AN interesting contribution has recently been made to our knowledge of hereditary ataxia by Dr. L. F. Barker, who has published the results of his examination of the brain and cord in two cases of this disease (Chicago University Decennial Publications). His cases belonged to the series already described clinically by Dr. Sanger Brown of Chicago. His results are in complete accord with those of Dr. Adolf Meyer in another case of the same series, and they seem to show that in cases descended from a common ancestor the pathological lesions are the same. Apparently, however, different series may present slight clinical and pathological variations.

Apart from its pathological interest, which is very great, this monograph occasions many suggestive reflections. The genealogical tree given by Dr. Sanger Brown in the clinical introduction forms a most valuable study in heredity. Out of sixty-five persons there enumerated as descended from one individual affected by hereditary ataxia, twenty-four were victims of the same disease. No doubt the genealogical tree is not complete, as no account appears to have been taken of families in which the disease did not occur. From the point of view of Prof. Pearson and the mathematical students of heredity, this is a fatal defect, as exact laws of inheritance cannot be deduced from such limited material. A distinctive disease like hereditary ataxia would, however, afford excellent material for such exact study, and it would be of very great interest and no little value if Dr. Sanger Brown would collect the material for and publish a complete tree, including all the individuals of all the families, whether affected with the disease or not. No doubt he has already much information about many of these individuals as the result of his previous inquiries, and a little further perseverance might suffice to complete his information.

At the present time, many investigators engaged in the tracing of causes in disease are seriously hampered by the almost entire absence of accurate information about the occurrence of these supposed causes in cases which do *not* exhibit the disease in question. To take the case of tabes dorsalis and its relation to syphilis. The exact figure which will express mathematically the weight which is to be attached to this factor in causation is still absolutely unknown. And it will remain so until it is known not only how many cases of tabes have a history of syphilis, but also how many cases of syphilis do not develop tabes. Even were the latter known, there would probably still be left other factors whose influence would have to be taken into account. But if it were known, such information would undoubtedly be of very great value in itself, and it would assist materially in the elucidation of those other factors which are as yet obscure. It is probably a wild dream to imagine a time when the health history of every individual in the State will be as readily available to the earnest seeker after medical truth as Burke's Peerage is to the society parasite. The laws of heredity and the relation of cause and effect in disease would then be practically within our grasp.

The Decline in the Prevalence of Septic Diseases.

In a song written by an Edinburgh physician, the tubercle bacillus is represented as being so harried by modern therapeutic methods that it is only conscious of safety while under artificial cultivation in a laboratory. The sentiment expresses a condition of affairs which is the object of our ambition to bring about. It would appear that the accumulated efforts to destroy bacteria of every kind are bearing fruit in fields where there was least expectation of reaping a harvest. If we review the surgical patients who apply for treatment at a large modern hospital, and contrast their ailments with those of twenty or thirty years ago, we are struck, not by the aseptic healing of operation wounds, for this is nowadays taken for granted, but by the diminution in the number of the common surgical ailments which result from accidental infection with pyogenic bacteria. We might instance boils, carbuncles, abscesses, cellulitis, osteomyelitis with its consequent necrosis, cancrum oris and other forms of bacterial gangrene as examples of septic diseases which have diminished in frequency. According to the fantastic "Conception of Disease" recently promulgated by Treves, this should be regarded as a sign of degeneration of the race and as a thing of evil omen. From the humanitarian point of view we regard it rather as a matter for congratulation. It is probably due, in part at any rate, to the improvement of hygienic conditions in our large cities and to a wider practical application of the gospel of cleanliness. The universal exhibition of so-called antiseptics is a feature of modern civilisation; their characteristic odour not only greets us on entering our hospitals, but it pervades even our lavatories, stables, dog-kennels, sheep farms, and barbers' shops, while the "destructors" erected by the civic authorities are probably the most wholesale germ-killers invented by man. We are under the impression that this widespread activity in the destruction of micro-organisms is a factor in the diminished prevalence of bacterial diseases of everyday life, and the knowledge of this should prove a stimulus to bear harder on the enemy than heretofore, in the hope of ultimately exterminating those organisms which are injurious to human flesh and destructive of life.

Puerperal Fever.

When, in 1869, an Act for the Compulsory Notification of Infectious Diseases was passed, it was not very clear why two such diseases as puerperal fever and erysipelas had been included. Neither disease is easy of exact definition, and it goes almost without saying that the framers of the Act did nothing to assist the general practitioner in this respect. The result has been that what is, and what is not, puerperal fever and erysipelas is very largely a matter of geography. In certain districts every abnormal puerperium and the slightest erythematous blush are regarded as coming within the meaning of the Act; whereas in other, and possibly adjoining, districts only women in the last stages of septicæmia, or patients with the most severe and extensive erysipelas, are reported to the Medical Officer of Health. A further anomaly arose at the time of the passing of the Act, inasmuch as Local Authorities were quite unprepared to follow up the Act with its only logical sequence, namely, the provision of means for the prevention and treatment of cases. Indeed, the view is strongly held by some authorities, that it is not incumbent on them to provide hospital accommodation for such cases, although they accept the responsibility in regard to other notifiable diseases like scarlet fever, diphtheria, and enteric fever. So far as England is concerned, the necessary corollary to notification of puerperal fever has been obtained in the Midwives Act, which gives Local Authorities a certain amount of control over one of the chief causes of the disease.

In Scotland there is comparatively little practice of midwifery by midwives, and, we believe in consequence, considerably less puerperal fever than occurs in England. Whether this is so or not, however, we are heartily in agreement with much that Dr. Knyvett Gordon has to say on the subject. From a series of fifty cases of puerperal fever sent into Monsall Fever Hospital, he found that the majority of the women had been delivered by midwives, and that they were responsible for the bulk of the notified cases. The remainder occurred in the practice of medical men, and he is strongly of opinion that, in both, the chief cause of infection is to be found in unnecessary interference with the patients. In the majority of midwife infections two agents are mainly responsible—dirty clothes and the practice of giving vaginal douches. In almost all of these cases the organism present is *B. coli communis*, and the primary source is, in all probability, the patient's own rectum. In cases infected by medical men he found that the incubation period was much shorter than in midwives' cases, and that all had been delivered by forceps, or the labour otherwise interfered with. The organism present in these cases was some form of streptococcus. We must all agree with some of the practical conclusions at which Dr. Gordon arrives: that the condition "puerperal fever" should be more clearly defined; that the regulations of the Central Midwives Board should be modified so far as regards the midwife giving vaginal injections; and finally, that if we insist on the notification of puerperal fever, we are bound to provide, and provide adequately, for the proper treatment of its victims.

At the December Meeting of the Royal College of Surgeons, Drs. Peter Hume M'Laren and James Ritchie were re-appointed representatives of the College on the Board of Management of the Royal Infirmary.

We regret to have to record the death of John Cameron (M.B. Edin., 1877) of Innerleithen, of Robert Laidlaw (M.B. Edin., 1881) of Ladybank, Angus Grant (L.R.C.P.S.Ed., 1896) of Haddington, and of Alexander Thom (M.D. Edin., 1882), late of Crieff.

At the Annual Meeting of the Royal College of Physicians, Dr. John Playfair was re-elected president, Dr. Thomas S. Clouston, vice-president, and Sir Thomas R. Fraser, Sir John Batty Tuke, Dr. Charles E. Underhill, Dr. James Ritchie, and Dr. R. W. Philip were elected members of council. At a subsequent extraordinary meeting, Drs. Affleck and Underhill were appointed representatives of the College on the Board of Management of the Royal Infirmary.

ORIGINAL COMMUNICATIONS.

THE CLINICAL VALUE OF BACTERIOLOGY.[1]

By FREELAND FERGUS, M.D., F.R.S.E., *Surgeon, Eye Infirmary, Glasgow.*

WE must admit that it is now beyond dispute that at least the majority of acute inflammations of the conjunctiva are the direct results of micro-organic life. About twenty years ago, when I was on the staff of the Glasgow Eye Infirmary at Charlotte Street, I remember very well certain patients attending the dispensary who all came from the same tenement in the High Street, and who were all afflicted with acute catarrh. On making investigation, I found that a large number of persons in that tenement were similarly affected. I now know what I did not then, that I was dealing with an epidemic of conjunctivitis due to Weeks' bacillus. It seemed to me at the time that we were dealing with a condition in the eye very analogous to one of the specific fevers in the body. Even at that time the gonococcus was recognised as the cause of purulent conjunctivitis. Since those days matters have changed completely, and it is now believed that there is probably no case of acute conjunctivitis which is not associated with micro-organic life. If we examine the text-books of that period, we will find cases such as I have described as epidemic generally attributed to cold, to draughts, to badly ventilated rooms, sometimes even as the result of exposure to excessive heat.

The micro-organisms of the conjunctiva may be roughly divided into two groups, namely, first, those which are frequently found on the membrane, but only under special circumstances cause inflammation. The chief members of this group are—*Pneumococcus*, *Staphylococcus aureus*, *Staphylococcus albus*, and *Streptococcus*. Secondly, those which, so far as I am aware, always cause an inflammatory attack, although in some cases not at all acute. To this class belong the gonococcus, the diplo-bacillus of Morax, Weeks' bacillus, the Klebs-Löffler bacillus, the diplo-bacillus of Petit.

Pneumococcus.—This is one which is sometimes found in the healthy conjunctiva, but, on the other hand, is very frequently associated with severe pathological processes. It often gives rise to conjunctivitis. It is very frequently associated with hypopyon, and is very common in dacryocystitis. In the organism the cocci are oval or tapering, generally having the appearance of diplococci, or united into small chains and surrounded by a capsule. They are about 1 micro-millimetre in length. The organisms as grown in cultures have no capsule. They are easily coloured by the basic aniline dyes, and retain Gram. The best medium for their cultivation is serum agar. When they give rise to conjunctivitis, the case is, as a rule, tolerably severe. Such conjunctivitis is specially common in newly-born children, and may, when an insufficient examination is made, be mistaken for the specific ophthalmia neonatorum. Many of the cases of membranous conjunctivitis are also associated with this parasite. It may be said without fear of contradiction that the pneumococcus is the most common organism in hypopyon ulcer.

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[1] Remarks made at a demonstration to the post-graduate students at Glasgow Eye Infirmary, December 1905.

Staphylococcus aureus is, as a rule, very readily recognised by the yellow appearance of the growth in the agar-agar tube. The organisms are not very common, but undoubtedly may give rise to trouble in the conjunctiva. They are sometimes associated with attacks of conjunctivitis of a mild type. The chief importance of their presence in the conjunctiva is that operations as a rule should not be undertaken till they have been removed by suitable treatment.

Staphylococcus albus is very easily recognised from its white lardaceous appearance in the agar-agar tubes. It is all but innocuous. An exception to this rule will be mentioned at a later period of the evening.

Streptococcus, on the other hand, is undoubtedly dangerous. It is doubtful if it is ever present without setting up an acute conjunctivitis. I have myself, however, seen a conjunctiva perfectly quiet at the time, in the secretion from which were found streptococci. The patient gave an account of a previous and recent acute attack of inflammation.

It is frequently associated with some acute condition in the lachrymal passages, but at times seems to have only very feeble virulence. It is interesting to note that not infrequently it is found in cases of dacryocystitis, and that certain of these cases closely resemble genuine attacks of erysipelas. Quite recently I saw a patient who had been certified as having true erysipelas. In this particular individual there was obstruction of the lachrymal passage on one side, and in the secretion there was found streptococcus. The attack of erysipelas had been confined to the same side of his face. It is sometimes difficult to draw the line between genuine erysipelas and acute dacryocystitis. All ophthalmic surgeons who have any large experience in treating lachrymal sac conditions must have observed that the passing of a probe was sometimes followed by acute cellulitis of the parts involved. When I was a student, I saw a case in which the inflammation spread all over the upper part of the face, extending even to the forehead. It seems to me that such an occurrence may be very readily explained, by supposing that the passage of the probe has wounded the tissues, and thereby given rise to an inoculation.

The parasite appears characteristically in the form of small chains of cocci. It is sometimes found as part of the contents of the leucocytes, and is easily stained with the basic aniline dyes, and retains Gram. It is easily cultivated on agar, and is very frequently found in acute dacryocystitis, although only very rarely in lachrymal mucoceles. Sometimes it is found in pseudo-membranous conjunctivitis.

Of those which are only known to exist in the conjunctiva in connection with an acute inflammatory attack, probably the most frequent is *Weeks' Bacillus.* These parasites grow on agar, but much better on blood serum. They are about 1 micro-millimetre in length, stain easily with methylene-blue, but decolorise with Gram. They tend to become grouped in the protoplasm of the cellular elements. So far as I am aware, the only disease which they produce with regard to the eye is an acute muco-purulent conjunctivitis, which generally is perfectly simple, and does not involve any serious consequences. In about 5 per cent. of the cases there is a slight ulceration, chiefly at the margin of the cornea, but where that takes place there not infrequently is a history of the eye having been bandaged or fomented or poulticed.

The condition is highly contagious, and the infection is generally conveyed by towels, or by persons using the same basin, or by the fingers.

The *Diplo-Bacillus* of Morax produces a form of ophthalmia which is generally mild. There is reason to believe that this parasite has a good deal to do with those cases which are generally classed as blepharitis marginalis. This parasite is of relatively considerable dimensions. It is from 4 to 5 micro-millimetres in length, and 1 in breadth, and has little tendency to become intra-cellular. It grows well on ascitic agar, but not on ordinary media. The parasite is easily distinguished by a sort of constriction at its centre, to which the name diplo-bacillus is due.

The *Gonococcus* is one of the most important of all eye parasites, because it is one which is very dangerous to sight. It stains easily with methylene-blue, and becomes de-stained by Gram. The parasite is reniform in shape, and is, in general, intracellular. It develops well on serum, but does not grow on other media, such as agar-agar. Sometimes it is a matter of importance to distinguish this micro-organism from another to which the name "pseudo-gonococcus" is given.

The pseudo-gonococcus retains its colour when subjected to Gram, and will grow on the ordinary media, such as agar-agar.

The last micro-organism which I wish to mention is the *Klebs-Löffler Bacillus*, which should always be looked for in all forms of membranous ophthalmia. These parasites are of considerable but of variable size. They are easily stained with the basic aniline dyes, and retain their colour when subjected to Gram. They are best grown on coagulated serum. This, of course, is the parasite associated with diphtheritic ophthalmia, and it is a matter of importance to be able at once to diagnose so very dangerous a malady. It is true that membranous ophthalmia sometimes occurs without this parasite, but when it is found we should always remember that the patient has a grave constitutional as well as a local disease, and in some cases it will not merely be justifiable but necessary to adopt serum injections.

I wish now to say a few words as to the importance of bacteriological investigations in clinical work. To begin with, there is no other method in which we can in the early stages distinguish between the various forms of conjunctivitis. It is a great advance on the older practice of seeing a patient with an inflamed eye; of giving the condition the name of catarrhal ophthalmia, and of prescribing one or other of the lotions and possibly one of the ointments formerly so much in vogue. The late Sir William Aitken, in advocating in general medicine the necessity of making frequent post-mortem examinations, said that the physician who neglected such work might see many cases but saw few diseases. The more recent developments of pathological biology have given us a method of easy diagnosis which is of great value, although yet in its infancy. The oil immersion lens is to my mind just as necessary a part of the apparatus for diagnosis in an ophthalmic clinic as is the ophthalmoscope. There is no doubt that the best results can only be obtained by a thoroughly trained and expert pathologist, which I do not pretend to be; but even surgeons who are not in this sense experts can obtain information which is to themselves and to their patients of the very first importance. Supposing a patient appears at the clinic with a catarrh, how else are you to determine in its early stages whether it is a simple catarrh produced by Weeks' bacillus or one of the graver and more serious forms, such as that due to the gonococcus or the Klebs-Löffler bacillus? I know of no other method; yet such an early diagnosis is simply vital in the treatment of the case for should you get the gonococcus it will be your duty at once to warn the patient and his friends of the contagious nature of the disease, and of the dangers which may arise to the other eye of the individual or to other persons from contact. If you have undoubted evidence of the presence of the gonococcus in one eye, it is your duty to seal up the other so that no contagion is possible. Given the presence of the Klebs-Löffler bacillus, it would be your duty to watch the patient constitutionally very carefully, and in some cases it might even be necessary to inject the anti-diphtheritic serum. Personally, I do not remember to have ever seen a case of this kind; they are somewhat rare in Great Britain, but are frequent enough in some other parts of the world.

It is also of importance that, if possible, every eye which is to be operated upon should be examined bacteriologically before it is touched, and in all cases, except where there is urgency, no operation should be undertaken till the surgeon has satisfied himself that no pathogenic micro-organisms are present. I have not seen a suppuration after an operation involving the opening of the eyeball for a very considerable time. With one exception, to be noted presently, if, on bacteriological examination, evidence of the presence of bacteria is not found, then the case will give you no trouble. As a rule, the conjunctiva will remain almost normally white.

The one exception to be noted is that often tolerably acute inflammation follows operation where the patient is rheumatic or gouty, and I always approach such cases with some trepidation.

Where you get the *Staphylococcus albus,* unless it be very abundant, you may operate with safety, but generally in such cases there is a good deal of external catarrhal disturbance after the operation, although I have never yet seen an eye lost from the presence of this parasite. Of course no amount of care will prevent the occurrence of intraocular hæmorrhage and the escape of vitreous. They will probably give trouble alike to patients and surgeons till the end of time.

Lastly, what new views as to treatment do we obtain from the modern theory as to the infectivity of conjunctivitis, and even of blepharitis, for of late many cases of this disease have been shown to be due to the diplo-bacillus of Morax? All treatment must be viewed under two aspects, the prophylactic and the curative. In general medicine, prophylaxis has made enormous strides, with the result that several of the specific fevers are now almost never seen; even tuberculosis has decreased very much since the malady was definitely recognised as infectious. In the prophylaxis of a patient who has an inflammation of the conjunctiva, two points must be attended to—(*a*) If only one eye is affected, then care should be taken that the other eye is not involved; (*b*) those in attendance on the patient must be warned of their danger.

As regards actual treatment, little if any progress has been made. No doubt many of the older remedies which were so much in vogue in the year 1879, when I entered the Glasgow Eye Infirmary as a student, have fallen into disuse, and new ones have taken their place. The question is, are these new preparations of greater utility than those which they have supplanted? I think not. The whole attitude of mind of a certain French school which is sometimes copied in this country reminds me forcibly of the history of a series of patents to diminish the consumption of coal in steamers. The first improvement was to save some 50 per cent. of the fuel. This was immediately followed by another to save another 25 per cent. Four or five years later an enterprising engineer made an improvement to save an additional 30, and so on till the steamer at last must have been making coal at a very considerable rate. It seems to me that there is something analogous to this in so-called modern ophthalmic therapeutics.

A few years ago somebody invented protargol, which is, as everybody knows, an organic preparation of silver. It was announced as being marvellously efficacious, infinitely better than nitrate of silver, and the surgeon could use it without producing argyrosis. Protargol was said to have greater penetrating powers than nitrate of silver, and was altogether to revolutionise ocular therapeutics. A few months dispelled a part of this statement, for the salt was found to produce argyrosis quite as markedly as silver nitrate; and I think its great potency in curing disease may well be doubted when we consider that a few months later it was found necessary to invent another drug, known by the name of argyrol. Again there was the usual excitement, and great healing virtues were claimed for the new remedy.

Still more recently, other drugs of a like nature have been announced as possessing most wonderful properties. The whole thing is to my mind rather suggestive of some firms of manufacturing chemists who have certain articles to put on the market; their success depends on the fact that most persons are richer in faith than in the critical faculty. At any rate I have not found any of these drugs at all to coincide in value with their vaunted efficacy. Moreover, Mr. Bishop Harman, who has looked into this question tolerably thoroughly, has nothing to say in their favour. So far as proofs are available, they entirely confirm the views which we have expressed, and, in concluding, I would like to call attention to four distinct lines of argument.

1. Most cases of conjunctivitis heal of their own accord, just as do the specific fevers. In days gone by it was the practice of some physicians to administer small doses of belladonna to patients who were afflicted with scarlatina. No doubt a due proportion of such patients recovered. Would any one at present attribute their recovery to the infinitesimal doses of belladonna which had been administered?

So I should hesitate, when an infectious conjunctivitis recovers, to attribute the issue to any drug used. Such cases as, say, the conjunctivitis of Morax or of Weeks, will recover after they have run their course if simply left alone and kept clean. Take a case of Weeks' conjunctivitis: you put into the conjunctival sac a few drops of a solution of protargol, and the patient gets better. I hold that you are not entitled to regard this as cause and effect, unless, indeed, you are prepared, when a patient who has a Weeks' conjunctivitis and is under one of these new remedies is found on a subsequent visit to the hospital to have developed a corneal ulcer, to attribute this ulceration to the remedy employed. If you attribute recoveries to the use of these drugs, I fear, as a matter of logic, I must insist upon your attributing also the untoward events, which will take place in a certain proportion of cases, to the same remedy. One of the most extraordinary statements I have ever read is that solutions of protargol are much better than nitrate of silver, because the weaker the solution the more potent the drug. For example, a $\frac{1}{2}$ per cent. solution is more powerful than a 2 per cent. solution.

To my mind it is a curious idea that, used in proper doses, the efficacy of a remedy is inversely as its strength.

2. In our agar-agar tubes with cultivations upon them we have a means of investigating this subject. Again and again the colonies growing in these tubes have been for considerable periods immersed in a 15 per cent. solution of protargol, and certainly for the most part without making the slightest difference to them. Mr. Harman points out, and probably truly, that as protargol is a colloid, and not a crystalloid, its powers of penetration must be extremely limited.

3. My own clinical experience has by no means given me the favourable results which other men speak of. I have already summarised this aspect of the question in an article which appeared in the *British Medical Journal*, and to which I may refer. Since writing that article, a very striking case has come under my notice. It was that of a gentleman with senile cataract, who had a constantly inflamed conjunctiva on the same side as the eye on which I proposed to operate. I delayed the matter for a month, and sent him to his doctor in the country, who forthwith began to apply protargol regularly and systematically. By the end of the month the conjunctiva had become considerably more inflamed, and the parasite which was the cause of the conjunctivitis was a great deal more abundant than it had been a month previous. No improvement had been effected at all by the protargol. What really put that man right was to give up all so-called astringent remedies and to irrigate his conjunctiva thoroughly three or four times daily with a large quantity of tepid normal saline. This has been my invariable experience. The only way in which you can get a chronically inflamed conjunctiva clean is by brushing or rubbing and thorough irrigation. Some years ago I had an opportunity in one of the public hospitals of making an experiment on a large scale. The medical officer in charge was much troubled every now and again by an outbreak of contagious ophthalmia in the wards set apart for children. He asked me to pay some visits to the institution so as to see the cases with him. One-half of the children so afflicted were treated simply by irrigation, the others by irrigation and the so-called astringents, and, just as I had expected, the one set did quite as well as the other.

4. Not infrequently I have found that protargol and argyrol gave disappointing results in the hands of other surgeons. I have mentioned Mr. Bishop Harman; and more recently a medical man, who has had considerable experience of measles wards, tells me that he has found no perceptible benefit from the use of these drugs in the conjunctivitis which accompanies measles. But, further, within the last year I have seen a good number of cases

in connection with the Workmen's Compensation Act, and in a considerable proportion of these one of the eyes had, in consequence of injury, been removed. Not infrequently the socket from which the eye has been removed falls into a state of chronic suppuration. Often one of the pleas is that the man is not able to resume duty on account of this suppuration, and this condition may be found often five or six months or even years after the injury. It seems to me that if these drugs really had the value which some of their advocates claim for them, the matter should have been put right, or the suppuration checked, within a few days. Some of the gentlemen attending on these very cases are amongst the foremost advocates for the use of protargol or argyrol.

I therefore cannot believe that the drugs have been improperly applied; I have rather come to the conclusion that they have not the efficacy which is claimed for them.

Biological pathology, although still in its infancy, has done a great deal for the practitioner already, and doubtless has much in store. It may give us serums which will in the future save many eyes that at present are lost. But what I maintain just now is that it has already shown us that at present we have no drug which can be used to the conjunctiva in a sufficiently strong solution, or for a period sufficiently prolonged, to be germicidal.

Ophthalmic surgery must at the present moment be aseptic and not antiseptic. Success lies in the mechanical removal of the parasite. Well do I remember the prodigious claims which were made for boracic acid solution as an antiseptic in ophthalmic surgery. I even remember a prescription for a boro-glyceride lotion being solemnly added to the formula book of our own Eye Infirmary. I do not suppose anybody now claims active properties for these remedies. Some authors of undoubted experience tell us quite frankly that they find solutions of protargol and of argyrol more satisfactory than those of nitrate of silver.

I think there are some obvious explanations of this view of the case. To my mind the chief explanation is that these substances are very nearly inert. Nitrate of silver, on the other hand, in almost any strength, will cause destruction of the protecting epithelium of the conjunctiva, and will allow the parasite to get a firmer hold. In other words, they act better than nitrate of silver, because they are not harmful. Moreover, persons who employ protargol generally do it by a process of hard brushing or of wiping or of rubbing. I confess that I think any benefit derived is from the process employed and not from the drug used. It is the mechanical removal of the mischief, not its destruction. The modern biological pathology has done much for us, and its teachings are welcome alike to the surgeon and to the modern therapeutist. I feel confident that the surest progress is likely to be made by following the study of the natural history of disease.

BERI-BERI—AN INFECTED EUROPEAN CREW AT LEITH.

By Major D. G. Marshall, I.M.S. (retired), *Lecturer on Tropical Diseases in the School of Medicine of the Royal Colleges, Edinburgh.*

Recently, on the arrival of a large sailing vessel at Leith from Rangoon, it was found that of the crew, twenty-nine in number, twenty-five—namely, twenty-three Europeans and two natives—were suffering from beri-beri.

In 1901 a Commission was appointed by the Norwegian Government to inquire into the causes of the disease, and the precautions which should be taken to prevent its occurrence on board ship. The report of this Commission was translated by the Board of Trade, and submitted to a committee appointed by the Royal College of Physicians, London, for consideration and report.

The conclusion reached by this committee[1] was as follows:—"The Norwegian Report, like so many other reports on the same subject, fails to give a precise answer to the question 'What is the cause of beri-beri?' and until this question is correctly answered, such practical matters as prophylaxis and treatment must continue, as heretofore, hazy and indefinite."

To remedy this unsatisfactory state of matters, it is desirable that as much information as possible should be acquired concerning the disease. The relation of the circumstances under which this particular outbreak occurred should be of interest. The facts here recorded were ascertained from the captain of the vessel, a most intelligent and observant man, who was himself suffering from the disease on arrival at Leith, and from an examination of the ship's log.

(1) The ship was 164 days on the voyage from Rangoon to Leith, touching only at St. Helena. (2) The crew was entirely European, excepting two natives of India and one Japanese. (3) Only three Europeans and one native escaped the disease. (4) The ship left Rangoon on 16th June, and therefore during the early part of the voyage must have been exposed to the full force of the monsoon, causing the ship to be very "wet." (5) The cargo consisted of 3600 tons of rice meal.

For two years previous to leaving Rangoon for home, the ship had been carrying general cargoes in the Pacific and Indian Oceans. There had not been any marked sickness on board. After leaving Rangoon, land was not touched until, on account of the condition of the crew, the captain was obliged to put into St. Helena on 22nd September.

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[1] "Notice to Shipowners and Shipmasters," Handbill 215, Board of Trade, June 1904.

On 9th September, *e.g.* seventy-six days after leaving Rangoon, one of the crew reported sick, complaining of swelling of the legs. Two days afterwards the Japanese member of the crew was unfit for duty, with the same symptoms. He, from previous experience, was able to inform the captain that he was suffering from kakke.

On the 15th September, four other men were on the sick list; and by the time St. Helena was reached (thirteen days after the first case occurred) almost the whole of the officers and crew were suffering from the disease. The vessel remained for ten days at St. Helena. The worst cases were sent to the shore hospital for treatment; the rest kept on deck under awnings.

On 1st October, the sick men having been sent back from hospital, the voyage was resumed, all the crew except two being (according to the log) fit for duty. During the two months' voyage to Leith there were several severe relapses, the first mate in particular being most seriously ill with cardiac symptoms. But eventually the ship was docked at Leith on 30th November, with the crew complete, none of the cases having ended fatally, but all the officers and most of the men still showed marked signs of the disease.

In contrast to this, the captain informed us that while they were lying at St. Helena, two other sailing vessels called there with beri-beri among the crew; in the one case, two men and the first mate, and in the other, eight of the crew, had died of the disease.

Examination of Officers and Crew.—The crew were paid off directly the ship arrived, and there was little opportunity for examining them. It was noted, however, that a large proportion still showed signs of œdema.

The captain and first and third mates remained on board, and were carefully examined. The first named was found to be suffering from dilated heart; he walked with a hobbling gait, and exhibited all the usual signs of peripheral neuritis associated with beri-beri, especially in the left leg. There was marked anæsthesia and analgesia over most of the limb, but especially on the inner side of the foot and leg. About 3 in. above the ankle, completely surrounding the limb, was an area about an inch wide over which the most exquisite hyperæsthesia existed. The knee jerk on the left side was very much impaired.

The first mate still presented signs of œdema of the face, but was practically well. The third mate, one of the cases removed to hospital at St. Helena, still suffered from cardiac affection. There was epigastric pulsation, marked increase of dulness to the right, and, on auscultation, a peculiar irregular action, with systolic bruits and reduplication of the second sound at the base.

The crew appear to have chiefly suffered from œdema of the lower extremities, extending upward to the chest; none of them had œdema of the face. A large proportion suffered from cardiac symptoms, and were rendered unfit for duty, not from symptoms of paresis, but from being, as expressed in the log, "short winded."

In view of Hamilton Wright's theory that the primary lesion is in the stomach and duodenum, careful inquiries were made to ascertain if the onset of the œdema had been preceded by gastric symptoms. This was found to be the case, the men attributing their dyspeptic symptoms to the water, which, though perfectly clear when put on board at Rangoon, very soon turned a "dirty yellow colour."

It may be well to state very briefly the various theories which have been advanced regarding the cause of beri-beri, and to consider if any of them would assist in determining the cause of this particular outbreak. The causes assigned may be divided into predisposing and exciting.

PREDISPOSING.—*Heat, moisture, and overcrowding.*—It is generally admitted that these factors influence the onset and spread of the disease. It is more prevalent in tropical and sub-tropical regions during hot moist weather, and often breaks out in the forecastles of ships coming from hot climates through overheating on reaching colder climates.

The temperature on board this ship during the monsoon was doubtless high, and, owing to the rough weather experienced, it was also damp, but there was no overcrowding in the forecastle, which was particularly airy and dry, and the quarters occupied by the officers were very dry and spacious.

A place disease.—This may be set aside in this case. The ship had been in the tropics for two years without any cases of beri-beri. It is interesting, however, to note that previously two other captains of the vessel had suffered from beri-beri while on board.

Want of nitrogenous matter and fat in the food.—The dietary was ample, and in excess of the Board of Trade requirements.

Want of fresh vegetables.—This is a cause often overlooked. A sailing ship cannot carry a supply of fresh vegetables sufficient for a voyage of three or four months, and lime juice and preserved vegetables are indifferent substitutes. There was marked improvement in all the cases when St. Helena was reached and a plentiful supply of vegetables obtained.

The Norwegian report quotes cases of the occurrence of beri-beri on board ships which had not been in the "endemic" area, or had any connection with infected parts. The London Commission was apparently sceptical on this point, but it is well known that cases of beri-beri are not infrequent on whalers when calling at St. Helena on their return from the south.

The influence of race.—As a rule, Europeans are less liable to attack than natives, but this case shows that, given the necessary conditions, they may suffer equally with natives.

EXCITING CAUSES.—There are many theories regarding the cause of the disease. Some, as those which ascribe it to the consumption of stale or infected fish, or class it as a form of arsenical poisoning, need not be considered. Those worthy of consideration are—(1) The germ theory; (2) the toxin theory; (3) the rice theory; (4) the part played by insects.

Germs.—Several have been described as the active agent. Pekelharing and Winkler described a bacillus which they credited with a curious attribute, *e.g.*, that repeated infection by the bacillus was necessary to maintain the disease; they are said to have reproduced the disease by infection of lower animals with the bacillus. This view is not generally accepted. The Board of Trade advise restrictions in the use of tinned food, "70 to 80 per cent. of various kinds having been found to contain visible microbes."

Toxins.—Hamilton Wright, who has spent several years investigating the disease in the Malay Peninsula,[1] considers that the disease is due to a micro-organism which affects the stomach and duodenum, and, forming a primary lesion there, elaborates toxins which by dissemination throughout the body subsequently produce the nerve symptoms. In this respect he draws an analogy between this disease and diphtheria. He further states that the bacillus leaving the body in the fæces is re-introduced, not by any particular kind of food, but by food contaminated by contact with fæcally polluted fingers or clothing. Unfortunately the bacillus is still a hypothetical one, as Wright has not been able to demonstrate its presence. Everything points to the disease being due to toxic matter of some kind, but whether it is elaborated by a micro-organism or not is at present pure conjecture.

Regarding the outbreak at present under consideration, whether the bacillus was present or not, fæcal contamination of the food may, owing to the perfect sanitary arrangements on board, be set aside.

The rice theory.—The disease is specially prevalent in countries where rice forms a staple article of diet, and the possible connection between the consumption of mouldy or otherwise impure rice and the incidence of the disease has long been recognised. Lately, Travers, Wright, and others have endeavoured to prove, by extensive experiments on the feeding of prisoners, that this connection does not exist. On the other hand, other observers have brought forward instances to show that the disease may be due to the presence of either fungi or organisms in the rice, with the formation of ptomaines or toxins. This is recognised in ergotism and pellagra.

Clarke,[2] in the discussion on beri-beri at the last meeting of the British Medical Association, showed that Tamils do not suffer from beri-beri even when living in a country where this disease causes one-third of the total deaths. He ascribes this to the fact that they boil their rice before husking it, while the Chinese use rice which has been husked raw, and may be "contaminated by a poison which lies in the husk."

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[1] *Journ. Hyg.*, 1905, April; *Journ. Trop. Med.*, 1905, June 1; *Brit. Med. Journ.*, London, 1905, October 25.

[2] *Brit. Med. Journ.*, London, 1905, November 11.

The part played by insects.—It has been suggested that the virus of beri-beri may, as in yellow fever and other diseases, require an intermediate host for its proper development. Little work has been done in this direction, excepting a few inconclusive experiments with the ordinary bed bug, but it is quite possible that weevils (calandra-olyzar), beetles, cockroaches, and other insects may play a part either in the development of the active agent, or by acting as mechanical carriers of the infection.

"Rice meal," with which this vessel was loaded, is not, as the name would imply, a meal prepared by grinding rice, but is simply the husks and residue left in the process of husking; it is imported into this country to be used in the manufacture of feeding cake for cattle. When the hatches were opened, a most sickly, disagreeable odour was very apparent. The outer surface of the bags in which the meal was contained was covered with countless crawling insects, and a sample of meal taken at random showed them in large numbers. They were to be seen in all parts of the ship. Even in the officers' cabin they could be swept from the floor in handfuls. On examination, they were found to be small beetles about a quarter of an inch long. A thorough search of the ship for other insects was made by Mr. Evans, of the Natural History Department of the University, who has kindly furnished me with the subjoined list. It would be interesting to know if the presence of any of these insects has before been noted in connection with outbreaks of beri-beri.

1. Beetles.—*Tribolium ferrugineum F.*, in enormous numbers, on bags, and all over ship. *Alphitobius piceus OL.*, plentiful. *Latheticus oryzæ Wat.*, in small numbers.
2. Cockroach.—*Periplaneta Americana*, in large numbers.
3. Moth.—*Tineid*, species not determined; numerous.
4. Spider.—Not yet identified, common in dark corners about roof of the hold.

Conclusions.—The ship apparently became infected at Rangoon, but whether by an ambulatory case, or infected food, or cargo shipped at that port, is an open question.

The fact that both officers and men were affected points to some conditions on board common to all. These were—(1) Water supply, (2) weather conditions, (3) nature of cargo, (4) food supply.

(1) and (2) may be set aside—it is generally admitted that the disease is not carried by water; and the weather conditions, while they might tend to the spread of the disease, could not originate it.

(3) and (4). In an endeavour to account for this outbreak, which, owing to the number of Europeans affected, is somewhat unique, it is impossible to overlook the probability of its being due to the nature of the cargo and the presence of such enormous numbers of insects.

The food may have been infected when taken on board, and later it was probably infected by the insects, as, owing to their invasion of all parts of the ship, it was impossible to keep the food free from them.

I am indebted to Dr. Robertson, Medical Officer of Health at Leith, for affording me every opportunity of investigating the outbreak.

TYPHOID BACILLURIA.

By R. Dods Brown, M.D., D.P.H., *Royal Edinburgh Asylum.*

I. Historical.—Close on a quarter of a century has passed since the condition of typhoid bacilluria was originally described; but although so many years have elapsed, comparatively little attention has been paid to this highly important subject.

For long the stools have been looked on as the cause of the dissemination of typhoid or enteric fever, to the almost entire neglect of the urine. In 1873, Budd said:[1] "All the emanations from the sick are in a certain degree infectious. But at the same time it is one of the principal objects of this work to show that what is cast off from the intestine is incomparably more virulent than anything else."

Mention of the presence of bacilli in the urine of patients suffering from enteric fever appears to have been made first of all by Bouchard of France, at the International Congress of Medical

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[1] "Typhoid Fever, its Nature, Mode of Spread, and Prevention."

Table No. I.—*Showing Work done in period of Unreliable Bacteriology.*

Name.	Year.	Cases Examined.	Positive Results.	Per Cent.
Bouchard	1881	65	21	32·30
Hüppe	1886	18	1	5·55
Seitz	1886	7	2	28·57
Berlioz	1887	14	2	14·28
Koniaiev	1888	20	3	15·00
Neumann	1888	23	6	26·08
,,	1890	48	11	22·91
Karlinski	1890	44	21	47·72
Silvestrini	1892	7	7	100·00
Barte de la Faille	1892	27	4	14·81
Wright and Semple	1892	7	6	85·71
Blumer	1895	60	2	3·33

Science held in London in 1881. He showed that he had met with bacilli in the urine, and he stated that the micro-organism had all the morphological characteristics of the germ found in the blood of the same patients. Of sixty-five cases examined, he found the bacilli in the urine of twenty-one.

From this time many investigators in different countries worked at this question with varying results. These are summarised in Table I., which takes us up to the year 1895.

Unfortunately, many of these early investigations cannot be regarded as at all accurate, because it was only in 1895 that Escherich discovered the *Bacillus coli communis* and separated it from the *B. typhosus*, and faulty differentiation of these two organisms would account for the high percentage obtained in many cases.

They had not the means of distinguishing the typhoid bacillus from the colon group of organisms. They found a bacillus which was motile, rod-shaped, and which grew on certain media very much like typhoid bacilli, but the tests used were inaccurate and insufficient. It was only in 1896 that Widal gave us a reliable means of separating Eberth's bacillus from the colon group of bacilli.

In more recent times, much work has been done on this subject by Petruschky, Gwyn, Horton Smith, and Richardson, and these open up a new period in the history of typhoid bacilluria. In 1897, Horton Smith read a communication before the Royal Medical and Chirurgical Society, London, and in this he declared that he had found *B. typhosus* in the urine of three cases of the seven examined by him. This involved sixty-one observations. As soon as the case was diagnosed, the urine was taken and examined every second or third day till about a week after the temperature had become normal. Seven cases were examined, and in three of these typhoid bacilluria was present. With regard to the time in the course of the case when this condition was got, Horton Smith never found the bacillus present before the third week. In one case it was found on the thirty-ninth day, notwithstanding the fact that ten observations were made previous to this. Smith emphasised the fact, first pointed out by Neumann, that the bacilli may be present in such enormous numbers that the urine is rendered turbid. He found that the condition of bacilluria may in some cases be known to be present, because if a test tube with some urine in it be shaken and held up to the light, a peculiar shimmer is seen, such as is got in a broth culture of the organism. The conclusions which he came to as a result of his research are given as follows:—

1. *B. typhosus* occurs in some urines, not in all.

2. When the bacilli occur they are in considerable numbers, a plate made with $\frac{1}{2}$ c.c. being sufficient to detect them.

3. The bacilli appear during the third week or later, and

therefore can rarely be of assistance in diagnosis. If bacilli are got earlier they will probably be the colon bacillus.

4. The urine should be disinfected.

In 1899, Horton Smith published a second memoir, in which he drew attention to the part played in the dissemination of typhoid fever by the urine and fæces respectively. Of twelve urines examined, he found the typhoid bacillus in four. Of these four, one was a case with pyuria occurring on the thirtieth day of the disease, continuing through a relapse of fifteen days' duration, and persisting for a few days into convalescence. The bacillus was found in large numbers. In this case the stools were examined four times, and on each occasion a negative result was obtained.

The work done in regard to the presence of the bacillus in the fæces seems to show that the dejecta contain that organism early in the disease.

Horton Smith examined twenty-nine stools, and found the bacillus in each, but only during the first two weeks.

The third series of observations made by Horton Smith, and published in 1900, consisted of forty-five cases of enteric fever. In seventeen of these the *B. typhosus* was found in the urine. Of the seventeen cases, six had been selected because of the urine having some peculiar characteristic; the others were chosen at random. The figures thus corrected give a percentage more in accordance with other observers.

In fifteen cases recorded by Horton Smith, the date of the first appearance is given in nine of them as follows:—

Day of Disease.		Day of Disease after Defervescence.	
15th	(twice)		...
24th	(once)		...
32nd	(„)	5th	(once)
36th	(„)	6th	(„)
39th	(„)	10th	(„)

That the bacillus was present in the urine for a varying time is shown by the following figures:—Duration of bacilli in the urine of nine cases, 8, 21, 30, 70, 13*x*, 18*x*, 19*x*, 34*x*, 40*x* days, where *x* indicates that the bacillus was present for at least that number of days, but the examination of the urine was not carried out further. The bacilli were present in such large numbers that in twelve out of fourteen cases the urine was rendered distinctly turbid, and a shimmer was seen when the urine was held up to the light and shaken.

In an article in the *Johns Hopkins Hospital Bulletin*, Gwyn draws attention to the great danger incurred through the omission of disinfecting the urine of typhoid patients. He points out that up till 1899 no proper systematic disinfection of that fluid was carried out. He dwells on the fact that in many cases the bacilli are present in enormous numbers, he himself having calculated as many as 500 million in 1 c.c. in one case. This shows the excessive quantity which may be passed by a patient at one time. In other words, a daily amount of urine would contain 500,000 million organisms, and, according to calculation, such a urine, diffused in 10 cubic metres of water, or sewage would give 50,000 colonies of bacilli per 1 c.c. of water or sewage.

Gwyn thinks that in from 20 to 30 per cent. of all cases Eberth's bacillus is present, and that, as a rule, it is found in pure culture. It may persist for months or years. He reports one case where he found the bacilli in the urine of a patient four years after an attack of enteric fever. Gwyn does not mention the number of cases examined by him, but in eight he found the specific germ, and one noteworthy feature of these cases is that in seven of them there was pyuria, while in five of these the pyuria was present along with bladder irritation. This seems an abnormally high proportion of both these conditions when compared with the figures of other observers. The time when the bacillus was found is stated as follows:—

In 3 cases in the third week.
1 case ,, fifth ,,
1 ,, ,, sixth ,,
1 ,, ,, third month.
1 ,, ,, fourth year.

In one case the patient suffered from nephritis.

Gwyn thinks that the presence of the bacilli in the urine may aid in the diagnosis in septicæmic cases, in which a Widal reaction is obtained late in the disease.

Petruschky examined fifty cases and obtained three positive results, the urine in each case being rendered distinctly turbid because of the bacilli being present in enormous numbers. He calculated that as many as 170 million bacilli were present in 1 c.c. of one specimen of urine.

Richardson made an exhaustive study of the question. In a series of thirty-eight cases, nine were affected with typhoid bacilluria; and in a second series of sixty-six cases he found this phenomenon present in fourteen. According to him, the post-febrile polyuria may aid in the expulsion of the bacteria, but in two cases which passed on an average 70 and 80 oz. of urine daily, no appreciable diminution in their number took place. He found there was a greater tendency to relapse and complication if typhoid bacilli were present in the urine.

Lewis thinks that the more severe the case the more likelihood there is of the urine being infectious. He thinks that if all the mild cases and all the severe ones were examined, only 10 per cent. would show the specific germ in the urine. He says that it is found in two classes of cases.

1. Got in severe cases, and at the height of the disease; and disappearing soon after albuminuria has passed off.

2. Got in severe and mild cases, and late on in the disease: persisting for weeks or months; albuminuria not necessarily present.

The results obtained by different investigators since 1896 are summarised in Table II.

TABLE NO. II.—*Showing Work done in Period of Reliable Bacteriology.*

Name.	Year.	Cases Examined.	Positive Results.	Percentage.
Horton Smith	1897	7	3	42·85
,, ...	1899	12	4	33·33
,, ...	1900	45	17	37·77
Levy and Gissler	1897	22	10	45·45
Schuder	1901	22	5	22·72
Lesieur and Mahaud . . .	1903	15	7	46·66
Herbert	1904	98	18	18·36
Besson	1897	33	6	18·18
Vincent	1903	46	9	19·56
Richardson	1898	38	9	23·68
,, ...	1899	66	14	21·21
Petruschky	1898	50	3	6·00
Lewis . . . . - .	1901	45	1	2·22
	...	499	106	21·24
Dods Brown	1905	15	8	53·3

II. The work on this subject which I carried out, and which I am now about to detail, was done in the laboratory of the Edinburgh City Hospital. I examined the urine of fifteen cases, and this entailed close on a hundred specimens. The diagnosis of enteric fever was verified in each case by Dr. Claude B. Ker, the medical superintendent of the hospital. The cases were taken at random from the wards, and none was selected because of any symptom of urinary trouble, or because of a suspicious-looking urine.

The procedure which, as a rule, I adopted was as follows—the patient was asked to pass urine directly into a sterilised flask immediately before the examination was made. A small quantity of this was then poured into a sterilised test tube and centrifuged. A sterilised pipette was used, and with this some urine from the bottom of the test tube was taken along with any deposit which might be present. From four to eight drops were then put on to a plate of agar or jelly and incubated at 37° or 20° C. At the same time a drop of the fluid was examined microscopically, and if bacilli were present a stained preparation was made. After twenty-four hours, if agar or three to four days if jelly, the plates were examined. If any colony looked at all suspicious, subcultures were made from it. The media used were sloped agar or jelly, broth, litmus milk, and glucose jelly.

Then if an organism was found which resembled *B. typhosus*, — presenting forms of different lengths, very actively motile, giving no indol reaction, not producing coagulation of milk even after many days' incubation, producing only a slight acid reaction, and not forming gas in glucose jelly,— the presumption was that we were dealing with *B. typhosus.* But over and above these tests, a Widal reaction was looked for in each case; and unless this was obtained, the organism was not considered to be Eberth's bacillus. The method which I employed was that recommended by Delépine. A young agar culture was used, and the dilution was 1 in 50. With all these tests, it was possible to say whether an organism was *B. typhosus* or not, and to eliminate the colon bacillus, which might very well be a source of error.

From the fifteen cases I examined I was able to obtain the organism in the urine of eight of them. In none of the eight positive cases was I able to isolate the bacillus in the early stages of the disease. The earliest day on which I found it was the twenty-eighth, but it is quite probable that the urine was infected prior to this, because it was at the first examination that I discovered it. The fifty-ninth was the latest day of the disease on which they were first found, although three observations were made previous to their discovery in this case.

Table IV. gives the day of the disease on which the *B. typhosus* was first found and the day on which it was last found. The x signs indicate that no observations were made after this day.

In no case was there a distinct deposit of pus, but in three out of the eight which contained typhoid bacilli there were a few pus cells along with some squamous epithelial cells which were in greater quantity than normal. In these there was a slight trace of albumin, probably such as could be accounted for by the pus present. No casts were seen in any of these three urines. In a fourth case (No. 5), albumin, epithelial, and granular casts were found, prior, however, to the discovery of the specific bacillus by about five weeks, and at only one observation were these found along with the bacillus.

The Table (No. III.) on page 122 shows in detail the results of the examination.

In the seven negative cases the organisms found were the *B. coli communis*, *Staphylococcus pyogenes aureus* and *albus*, *B. pyocyaneus*, either alone in pure culture or along with another organism. The *B. coli* was found in the urine of five cases, while the *B. pyocyaneus* was got in four cases, three of whom were females, the fourth being a boy.

TABLE NO. III.—*Positive Results.*

Case.	Urine Examined. Day of Disease.	Organisms Found.	Albumin, etc.	Severity.	Rose Spots.
1	29th, 32nd, 41st, 55th, 63rd, 69th.	*B. typhosus* and *Staphylococcus pyogenes albus.*	No albumin.	Mild.	Suspicious spots.
2	28th, 43rd, 45th, 53rd, 57th.	*B. coli communis*, *B. typhosus*, and *Staphylococcus pyogenes albus.*	,,	Moderately severe.	Some spots.
3	30th, 36th, 46th, 54th, 59th.	*B. typhosus* and *Staphylococcus pyogenes aureus.*	,,	Very severe.	Good spots.
4	47th, 54th, 66th, 71st, 74th, 81st.	*B. typhosus*, *B. coli communis*, and *Staphylococcus pyogenes aureus.*	Albumin, pus, and squamous epithelium.	,,	,,
5	20th, 22nd, 40th, 59th, 64th, 69th, 72nd, 74th, 85th, 92nd, 100th.	*B. coli communis*, *B. typhosus*, *B. coli communis*, and *Staphylococcus pyogenes aureus.*	Albumin and casts.	Very severe, relapse.	Suspicious spots.
6	14th, 18th, 42nd, 54th, 58th, 61st, 62nd, 67th, 72nd.	*B. coli communis* and *B. typhosus.*	Albumin and few pus cells.	Severe septicæmia.	Profuse rash.
7	41st, 44th, 47th, 51st, 56th, 58th, 60th, 64th.	*B. typhosus* and *Staphylococcus pyogenes aureus.*	No albumin.	Very severe, relapse.	Suspicious spots.
8	28th, 39th, 43rd, 47th, 50th, 62nd, 68th.	*B. typhosus* and *Staphylococcus pyogenes albus.*	Albumin, pus, and squamous epithelium.	Moderately severe, phlebitis.	,,

Pus was present in only one of these seven cases (No. 10), and the urine of this patient contained the *B. coli* in pure culture. In three of the eight cases the typhoid bacilli were in such numbers that they were readily seen when a drop of the urine was examined under the microscope, but a shimmer described by some was not observed in any case. From some urines the colonies obtained on cultivation were very profuse, while in others there were very few, and the same phenomenon was observed with the different specimens from the same patient—one day the bacillus was readily obtained, and at the next examination, perhaps, only one or two colonies were evident.

Although a small quantity of pus was obtained in three positive cases (*i.e.* 42·8 per cent.), none of the patients complained of any urinary symptoms, and there was an entire absence of cystitis.

III. From a study of the literature on typhoid bacilluria, it is apparent that, among the cases examined and recorded since 1897, there is no great uniformity in the proportion of those exhibiting this condition. The proportion varies from 2·2 per cent. given by Lewis, up to 46·6 per cent. found by Lesieur and Mahaud. Why there should be such a great difference in the positive results is very difficult to explain, except that the methods of examination may not have been the same. In some observations the urine may have been examined only in the early stages prior to the appearance of the organism, and few of the investigators make any mention of centrifuging the urine, a procedure which I adopted in all cases.

Another striking feature in these observations is the great disparity in the time of the appearance of the bacillus and in its persistence. Thus Horton Smith has found it as early as the thirteenth day of the disease, and in another case it was not got until the thirty-ninth day. Richardson obtained it on the fifteenth day, but in the majority of cases it was not isolated until after the thirtieth day of the disease. Vincent gives the usual period as from the eleventh to the seventeenth day, while Lesieur and Mahaud state that in two of their cases they found the organism on the tenth day.

The persistence of the bacilluria is just as variable as is the original appearance of the organism. Thus Petruschky had one case in which it was present seven weeks after the subsidence of the fever, while in another case it persisted six weeks after "cure." Vincent found it nineteen and thirty-seven days after the patient was considered recovered, and Busing relates a case where the patient was in vigorous health, and yet the organism was present in the urine six months after he was looked on as cured. Gwyn records one case in which bacilluria was got four years after an attack of typhoid fever, and Houston published a similar case in which the organism persisted for three years after the fever.

The Table below (No. IV.) shows at a glance the earliest day of the disease on which I found Eberth's bacillus, and the length of time it persisted. It also shows the day on which the temperature reached normal.

TABLE NO. IV.

Case.	*B. typhosus* discovered on	Temperature Normal.	*B. typhosus* persisted until
No. 8	28th day of disease.	43rd day of disease.	43rd day of disease.
,, 3	30th ,, ,,	29th ,, ,,	36th ,, ,,
,, 1	32nd ,, ,,	28th ,, ,,	55th ,, ,,
,, 7	41st ,, ,,	50th* ,, ,,	60th ,, ,,
,, 6	42nd ,, ,,	35th ,, ,,	72nd *x* ,, ,,
,, 2	43rd ,, ,,	28th ,, ,,	...
,, 4	54th ,, ,,	39th ,, ,,	81st *x* ,, ,,
,, 5	59th ,, ,,	47th* ,, ,,	85th ,, ,,

* Relapse temperature normal.
x The *x* denotes that the urine was not examined after this day.

Albuminuria.—Seitz, Besson, and Schichhold independently stated that bacilluria and albuminuria always go together, and that without albumin there cannot be bacilluria. On the other hand, Neumann, Horton Smith, Richardson, Vincent, and others found that albumin is not more frequent in cases with bacilluria than in those not complicated by the elimination of the organism in the urine, and my observations also show this to be the case.

Of the eight cases whose urines showed Eberth's bacillus, four had albuminuria. In three of these, however, its presence was probably due to the pus which was there, and in none of them was there more than a cloudiness. In the fourth case albumin was got along with granular and epithelial casts, but prior to the discovery of the organism. In one case (No. 10) where typhoid bacilli were not got, albumin was found, and this again was probably due to the pus, which was in small amount.

Pyuria.—Pus was got in three of the eight positive cases which I examined, and in one negative case. Blumer found it to exist in ten out of sixty cases, while Horton Smith put the proportion as high as 50 per cent. Gwyn got it in seven of his eight cases. That cystitis due to this bacillus is very rare, is shown by the fact that out of 1200 cases, Vincent found it to exist in only two.

Turbidity.—In none of my cases was turbidity noticed. Petruschky describes it as occurring in only three out of fifty cases. Horton Smith in one series of observations gives it as happening in two out of twelve cases, while later he says he found it in twelve out of fourteen urines examined, and in which typhoid bacilli existed.

Severity.—Richardson says that, "in a general way, the cases which showed typhoid bacilli in the urine were of a more severe type, as evidenced by the clinical course and mortality. Especially to be noted is the tendency to relapse and complication."

This statement has been supported by Horton Smith. Five of the eight cases which I examined, and in which the specific germ was found, were described as being very severe, two were noted as moderately severe, while one was a mild case of enteric fever. Two cases suffered from a relapse (No. 5 and No. 7), and in one case (No. 8) phlebitis was got as a complication. On the other hand, only two of the seven negative cases were very severe, two others were of moderate severity, while three were described as being of a mild type. It thus seems fairly evident that the more severe the case the more chance there is of the urine being affected.

Roseola.—The association of bacteriuria and roseola was early commented on. Some observers held that the two conditions always coincided; but that this is not necessarily the case has been pointed out, although there is more probability of bacilluria being got in those cases with rose spots than in those without them.

Summary.—To summarise what has been said, I think it is obvious that we have no means of accuracy by which we are enabled to say definitely that such and such a urine is infected with typhoid bacilli, other than by making a bacteriological examination.

That there is a possibility of its being infectious we can say when it is turbid, has an acid reaction, and presents that peculiar shimmer, but on these alone we certainly cannot rely, because of the very large proportion of urines which contain the bacillus and in which these conditions do not exist.

Again, because a patient has albuminuria or pyuria he does not necessarily have typhoid bacilluria, and the absence of the bacilli is not by any means proved if the urine is found free of these abnormal constituents. Many a clear non-albuminous urine is swarming with the bacillus, to discover which a bacteriological examination must be made.

IV. PATHOLOGY.—The original hypothesis as to the pathology of the condition was that the organism circulating in the blood irritated the kidney, and gave rise to a nephritis through which the passage of the bacillus from the blood into the urine was rendered possible. This theory breaks down at once in those cases in which there is an absence of albumin, and, as shown by Melchior, all the cases complicated by acute nephritis do not have typhoid bacilli in the urine. In four cases of enteric suffering from acute nephritis, he found the organism in the urine of only one.

Another theory put forward is that bacilluria is due to a filtration of the bacilli from the blood, but on several occasions in which the urine was swarming with the organisms, the blood was examined, and the bacillus was found only with great difficulty.

It is true that their presence may be due to suppuration in the kidney and to the passage of bacilli and pus into the urine, but that suppuration in the kidney is very rarely got is seen from the report of 289 post-mortem examinations of typhoid patients made at St. Bartholomew's Hospital. In only one case were renal abscesses found. Then again pyuria would of necessity be a constant concomitant; but, as we have seen, this is not so.

Blumer's explanation is that the bacilli pass from the rectum into the bladder through the tissues separating these two organs. It has been proved that if the rectum be irritated and cultures of certain bacteria be injected into it, a cystitis is very soon set up.

In typhoid fever it is exceptional to have a lesion as low down as the rectum, and moreover it is known that, although bacilluria is got well on in the disease, it is only in the early stages that the bacillus can be found in the fæces.

The adequate explanation seems to be that one or two stray bacilli manage to pass through the kidney from the blood and get into the urine, where they grow rapidly. This fluid has proved, experimentally, a very good medium for the growth of the *B. typhosus*, and in the bladder, where there is a suitable temperature and where the urine is regularly being renewed, everything is favourable for its further growth. This theory receives support from the fact that injections of disinfecting fluids, such as the perchloride of mercury, into the bladder cause the rapid and permanent disappearance of the bacilli from the urine.

V. TREATMENT.—It is only too obvious that typhoid bacilluria is a source of great danger not only to the patient, but to the general public. To overcome the risk something must be done, and some means must be taken to render the urine sterile. The drug which has proved of greatest value in this respect is undoubtedly urotropine. Richardson has made some interesting and useful researches with this drug, and these go to show that it is a urinary disinfectant of the very highest value.

While the bacilli may disappear from the urine under the administration of the drug for a short time, it is essential to continue its use for a considerable period, because it has been found that if it be stopped after having been in use for several days, there is a great probability that the urine will again become infected.

Gwyn, Horton Smith, and Fuchs obtained good results by its administration. Gwyn also adopted another method of treatment, namely, irrigation of the bladder with perchloride of mercury (1 in 50,000), with excellent results. Salol was used in some cases, but with no great success. My own experience of urotropine leads me to think that the drug must be continued for a week or ten days in big doses, in order to ensure the thorough disinfection of the urine and bladder.

In Case No. 5, urotropine was given on the 20th December in 7-gr. doses, t.i.d. On the 21st 10 grs., t.i.d., were given and continued the following day. No typhoid bacilli were found on the 22nd, but an examination being made on the 2nd January the organism was found in great numbers. From the 2nd January the drug was administered in 15-gr. doses, four times a day, up till the 7th January, from which time the same dose was given 4-hourly, and continued till the 9th January. The urine was found free of the organisms on the 9th, and was so when examined again on the 17th January.

The second case in which urotropine was used was No. 6. The drug was commenced on the 12th December, and given in 15-gr. doses, t.i.d., and so on the 13th. The urine was examined on the 13th, when a few typhoid bacilli were found on cultivation along with *B. coli communis.* On the 14th December no typhoid bacillus was present, or again on the 19th, but on the 24th December both *B. typhosus* and the colon bacillus were easily isolated from the urine. I was unable to follow this case further.

No. 7 was the third case treated with urotropine. It was commenced on the 17th January in 15-gr. doses every four hours, and then for the next three days, *i.e.* until the 20th inst., in the same amount, but t.i.d. On the 17th, *B. typhosus* was present, and also on the 19th, but, on the 23rd, *Staphylococcus pyogenes aureus* was the only organism cultivated.

In No. 5, 80 grs. were sufficient to clear up the urine, but twelve days later it again became infected; while in No. 6 the urine became free of the bacillus after the patient had taken 90 grs., but in eleven days the organism was again found in large numbers. The third case had as much as 225 grs. of the drug before the urine was free of the organism.

In one case (No. 13), where only *B. coli* was in the urine, urotropine was tried in 10-gr. doses every four hours. It was begun on the 12th December and continued till the 15th inst. On the 14th December the *B. coli* (and the *B. pyocyaneus*) was easily cultivated, and again on the 17th and 27th. From this it appears as if this bacillus was not much affected by the use of urotropine. In one case I used acetozone, but with no obvious benefit.

From what has been said, it is apparent that urotropine is the most useful drug which can be ordered in cases of typhoid bacilluria. It was introduced by Nicolaier as a urinary disinfectant, and appears in the urine partly as urotropine and partly as formaldehyde. It is eliminated in about fifteen minutes after administration, and can be found for some days after it has been stopped. It has no prejudicial action on any abnormal renal condition.

VI. Public Health.—It has been shown above that the typhoid bacillus very soon disappears from the stools of the patients suffering from enteric fever, and its place is taken by the colon bacillus; but although now the stools play little part in the spread of the disease, the patient really becomes more dangerous to those around and to the general public. The urine now may be teeming with the germ, and the pollution of sheets and blankets is too easily caused, and is extremely apt to be overlooked.

How easy it is for one or two drops of the urine to infect the clothes; and when we know that as many as 100,000,000 microbes may be got from 1 c.c., or roughly fifteen drops, it is easy to imagine how disastrous the result may be. Not only is this contamination liable to occur when the patient is in bed, but also during convalescence, when the patient is going about, and also after he is "cured." How readily may the hands of a patient with typhoid bacilluria become infected by the urine, and so give rise to trouble, and be the source of further disease. From infected hands, clothes and food may be contaminated, and the clothes are a source of danger, not only to those in attendance or in the same house, but to those who have the washing of them. One can readily understand precautions being taken with clothes which are stained with fæces, but those tainted with urine may be overlooked for a long time. It is only necessary to mention how easily a water supply of a town, village, or house may be unwittingly infected through the same cause.

VII. Conclusions.—To overcome the danger of typhoid bacilluria, it is not sufficient to give urotropine in small doses for a few days. It may perchance clear up the condition, but the probability is that it will recur. As seen in two of my cases, the typhoid bacilli disappeared under the administration of the drug after 80 grs. and 90 grs. respectively had been given; but in one case the organism reappeared in twelve days, and in the other in eleven days, after the drug had been stopped. This may be explained by a stray bacillus finding its way through the kidney and growing in the bladder; or what seems more probable is that some bacilli had been lying dormant in the vesical wall, and later took on active growth.

The conclusions which I think one is entitled to arrive at may be summarised as follows:—

1. The *B. typhosus* exists in the urine of typhoid patients in from 30 to 35 per cent. of cases.

2. In most cases they cause no symptoms, and their presence is revealed only by a bacteriological examination.

3. Bacilluria is frequently accompanied by albuminuria and pyuria, but these are not necessary concomitants.

4. The bacilli usually appear in the third or fourth week of the disease, and persist for a varying time—for weeks or months, and even after the patient is "cured."

5. Bacilluria is got more frequently in severe cases and in those with complications; but the severity of the case is not affected by the condition, which is of no prognostic significance.

6. The presence of bacilli in the urine does not aid in the diagnosis, except in some typhoid septicæmic cases.

7. The presence of the specific bacilli in the urine is more dangerous than their presence in the stools, because—(*a*) The disinfection of this fluid is apt to be neglected, and all attention paid to the fæces, which, after the third week, may contain no typhoid bacilli. (*b*) Contamination by the urine is less apparent than that brought about by the fæces, and thus clothes, etc., may be a source of great danger. (*c*) Pollution of a water supply is more likely to occur through urination than defæcation.

8. All typhoid patients, at whatever stage of the disease, should micturate into special receptacles, where the urine should be disinfected. Urination during bathing and when outside should be strictly forbidden.

9. All patients from the third week should be given urotropine in 10-gr. dozes, t.i.d., for ten days, and, after one week's interval, administration of the drug should again be carried out for other ten days.

After this a bacteriological examination of the urine should be conducted, and if the bacillus be present, the drug should be continued for a week after the urine is sterile.

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NOTES ON A CASE OF CONGENITAL ATRESIA OF THE CHOANA.[1]

By W. G. Porter, M.B., B.Sc.

Cases of congenital occlusion of the posterior nares are of interest to rhinologists, not only on account of their rarity, but also because they give a demonstration of the results of complete and permanent nasal obstruction, uncomplicated by any morbid process.

The case which I have had the opportunity of examining is under the care of Dr. Max Scheier of Berlin, and was shown by him to the Laryngological Society of that city; but as it is, in one point, unique, he has kindly permitted me to publish a more complete account of it, and for this I thank him most heartily.

Case.—The patient, an intelligent young woman, æt. 21, complains that she has been unable to breathe through the right nostril for some years. The history shows that her mother died of phthisis; her father is healthy. She is one of five children, three of whom are alive and in good health. Besides herself, none of the family, so far as is known, exhibited any abnormality. As a child, the patient was healthy; no difficulty was experienced in rearing her. Her father remembers that she had constant discharge from the right nostril; he further definitely states that she did not breathe through her mouth except when she had a cold. She does not snore at night. She herself has noticed her inability to breathe through the right nostril since she was 16. She has also observed that her right side, especially the right breast, is less fully developed than the left.

Condition.—The patient is well developed and nourished; her complexion is rather pale. A slight but definite asymmetry of the body is apparent. The right eye is rather more prominent, and is at a slightly lower level than the left. The right cheek is rather flatter, and the right naso-labial fold is less marked. More noticeable still is the asymmetry of the trunk and lower limbs. The right shoulder is lower than the left, and less clothed with soft parts. The right mamma is smaller, and hangs lower than the left. The upper arm is less developed on the right side, though there is no difference between the forearms and hands. No abnormal curvature of the spine can be detected. The right leg is shorter than the left, and the right foot is rather smaller.

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[1] From the Poliklinik of Dr. Max Scheier of Berlin.

Measurements.

	Right.	Left.
Upper arm	$10\frac{3}{4}$ in. . .	11 in.
Knee, maximum circumference . .	$13\frac{3}{4}$,, . .	14 ,,
Lower limb (anterior superior iliac spine to tip external malleolus) . .	36 ,, . .	$37\frac{3}{4}$,,

The patient is right-handed; voluntary movements are carried out against resistance equally well on either side; but she states that the right arm and leg are more easily tired than the left. The sense of smell on the right side is absent; on the left is unimpaired. The senses of taste and hearing are unimpaired, and the tympanic membranes are normal. A complete examination of the nervous system discloses no further abnormality.

Examination of the nose.—During even forced respiration there is no movement of the right ala nasi, nor is there the slightest passage of air through the right nostril.

Anterior rhinoscopy.—On the right side there is a slight deviation of the septum; the anterior end of the inferior turbinated body is large, and blocks the way to further examination. On the left side, the turbinated bodies are of normal dimensions.

Posterior rhinoscopy.—On the right side a pale grey wall is seen blocking the choana and flush with its margin, in it there is an oval depression, rather above the centre, and there are two minute indentations immediately above that. No cicatrices can be seen, and it is apparently covered by a continuation of the pharyngeal mucous membrane. On the left side the turbinated bodies can be seen. On the roof, immediately in front of the posterior nasal opening, a narrow grey strip of tissue is visible, apparently an attempt at the formation of an occluding membrane on this side also. This felt hard when touched with a probe. The distance between the septum and Eustachian orifice is greater on the left side than on the right.

Cocaine was applied to the swollen turbinated body on the right side; it was then possible, after syringing out a large quantity of tenacious mucus, to see the obstructing wall from the front. This, on being percussed with a probe, was proved to consist of bone. An attempt was made to estimate its thickness by trans-illumination, but without success. The palate was symmetrical. The measurements, which were carried out exactly after the method of Buser (1), a pupil of Siebenmann, and the author of the most recent paper on the form of the palate, were as follows:—

Height (at level of first molar, in this case the highest point), 24 mm. *Breadth* (at same level), 5 cms. *Palatal index* $= \frac{B}{H} \times 100 = \frac{500}{2{\cdot}4} = 48$, *i.e.*, we have here a typical low palate, the normal according to E. Fränkel (²) being up to 55.

The measurements of the face were—

Height (naso-frontal suture to cutting edge of central incisor), 7 cms. *Breadth* (inter-molar), 13 cms. *Facial index* $= \frac{H}{B} \times 100 = \frac{700}{13} = 53.$ The face therefore falls into the category of long faces, as the index is over 50. The larynx is normal, the voice is not nasal.

The heart, lungs, and other organs are healthy.

The diagnosis of congenital bony atresia of the choana was here obvious, from the history, from the appearance of the obstruction, and from the absence of any indication of present or past inflammation.

The treatment, which was carried out by Dr. Scheier, consisted in making, under local anæsthesia, a small orifice with a burr in the bony wall. This at first showed a tendency to close, but the margins are now healed. The discomfort from which the patient suffered has thus been entirely relieved. The sense of smell is now slightly present on the right side.

REMARKS.—The chief interest in this case lies in the association of asymmetry of the face and body with unilateral nasal atresia. Out of the total number of previously published cases of congenital occlusion of the choanæ, amounting now to nearly 100, the association of facial asymmetry is noted only in some twelve cases. In Schwendt's (³) collection of twenty-five cases, published in 1889, no instances are mentioned. In Haag's (⁴) series we find four such—three published by Keimer, Pluder, and Baumgarten, and one by himself. Cohn (⁵) notes further cases published by Joel, Morf, Onodi, Cresswell Baber, and also one of his own, and in addition to these I find cases published by Wolff (⁶), Hanszel (⁷), and Lewy (⁸). In only one of these cases—that of Haag—was the asymmetry associated with bilateral atresia. In three—Cresswell Baber, Hanszel, and Lewy—the hypoplasia was on the side opposite to the occlusion, and in every case it was limited to the face. The appearances must have been remarkably similar in all these cases; the points usually noted being—slight flattening of the cheek, partial obliteration of the naso-labial fold, and a slight difference in the level of the eyes, the one on the affected side being the lower. Morf (⁹) also notes in his case, that sweating was readily induced on the affected side. We see, then, that though the description of the facial asymmetry in these cases very closely corresponds to the appearances found in the present one, yet the latter is unique in that the hypoplasia extends to the trunk and limbs.

Ziem (¹⁰) in 1879 had indeed observed patients with unilateral nasal obstruction in whom there was impaired development of the face and spinal curvature. Conceiving the possibility of this depending on the nasal obstruction, he carried out a series of experiments on young dogs and rabbits. He rawed and sutured the margins of the anterior nares in some, and in others he blocked the interior of the nose with a pledget of wool; in each case one side only was so treated. Four to eight weeks later the animals were killed and examined. It was then found that the side of the face corresponding to the obstruction was the smaller, and there was present in addition a definite scoliosis, which Ziem thought was due to the unequally developed head throwing its weight more on one side of the spinal column than on the other. It is certainly conceivable that diminished pressure of air in the nose might prevent proper development of the antrum of Highmore, and so bring about some flattening of the cheek on that side, and also cause the eye to stand at a lower level. We have, however, already seen that clinical evidence negatives this view, for in three cases the hypoplasia was not on the side of the obstruction, and in one case it was associated with bilateral atresia. With regard to the present case, the thought suggested itself that possibly a nervous lesion might explain the hypoplasia of the trunk and limbs, but an examination of that system brought no confirmation of this view. We are therefore driven to the explanation accepted by previous authors, that we have to deal with a developmental abnormality, probably depending on the same causes as the atresia itself.

Cases of congenital occlusion of the posterior nares have been looked on as affording a classical example of the effect of mouth breathing on the form of the palate. This is undoubtedly true in the cases of bilateral atresia, but is not necessarily so, where the obstruction is confined to one side.

There are two main theories regarding the causation of high palate — one that it is due to mouth breathing, adopted by Koerner (11), Waldow (12), Bloch (13), and others; the other that it is merely a characteristic of the long narrow type of face known as the leptoprosopic. This view is advanced by Siebenmann (14) and his pupils. Those cases are naturally not considered where the high palate is found in persons mentally impaired, and in whom it has long been recognised as merely being one of the stigmata of degeneration.

I shall discuss this question only in so far as cases of congenital atresia of the choanæ throw light on it. Haag (4) found that the palate was said to be low in six cases out of twenty-one in which its condition was noted: he therefore concludes that mouth breathing is not a probable cause of high palate. His six cases, however, include a case of Ronaldson's (15), where the patient died a few hours after birth; the others were all cases of unilateral atresia, and in only two is it stated by the authors themselves—Simon (16), Gougenheim (17)—that they were mouth breathers. Of the cases published since this paper, in only three out of twelve, collected by Cohn (5), is the palate low, one of these—a case of unilateral atresia—cannot be included as it is not stated whether patient is a mouth breather or not. This gives a total of twenty-eight out of thirty-two, or 87·5 per cent. of high palates. That we are right in excluding those cases where the atresia is unilateral, unless it is definitely stated that there is mouth breathing, is sufficiently shown by the present case, where there is no doubt whatever that the patient usually breathed through her nose. I think these figures allow of the statement that the evidence of cases of congenital atresia of the choana is in favour of the Koerner-Waldow theory.

I should like to draw special attention to the normal hearing and unaltered appearance of the drum membrane noted in my case. This is not an uncommon experience, and is of importance, in view of the tendency in some quarters to find a cause in the nose for every middle ear affection.

Finally, may I be allowed to lay emphasis on the development of a sense of smell on the right side after operation? This seems to be hardly in accordance with nature's law that disease causes atrophy.

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SPONDYLITIS, OR THE "VERTEBRAL TYPE OF ARTHRITIS DEFORMANS."

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From the point of view of nomenclature, there is, I venture to think, one valid argument against our retaining the term spondylitis deformans.

The objection to my mind is this, that the use of the term seems to carry with it the inference that we are dealing with a condition in some way or other distinct from arthritis deformans. As far as my experience, gained at the Mineral Water Hospital, goes, no sharp differentiation is possible between the so-called "poker back" and the polyarticular types of arthritis deformans. If this be so, it would, I think, be wiser to adopt Oppenheim's suggestion that it be called "Arthritis Deformans of the Spine," or, better still, conform to Osler, who simply classifies it as "the vertebral type" of arthritis deformans; and under this heading he includes both the von Bechterew and the Strumpell-Marie type.

"Chronic ankylosing inflammation of the spinal column and hip joint" was assigned as the cause of this condition by Strumpell. In the Strumpell-Marie type, the shoulders, in addition to the hip and spinal column, were involved; and a further distinction is claimed for this type as opposed to the Bechterew, namely, that nervous phenomena are less obvious than in the latter.

According to Osler, in the Bechterew form the spine only is affected, with pronounced nerve root symptoms—pain, anæsthesia, atrophy of muscles, and ascending degeneration of the cord; and the disease is believed by him to begin as a meningitis, with resulting compression of nerve roots, loss of function of spinal muscles, atrophy of the intervertebral discs, and gradual ankylosis of the spine.

Rührah, in an exhaustive résumé of the subject in the *American Journal of Science*, however, points out that von Bechterew described two affections of the spinal column. One he terms "Ankylosing Inflammation of the Spine," and the other he describes as "Stiffness of the Spine." These he believes to be two distinct affections. He claims that the latter is of nervous origin, that there is present ascending degeneration, and that there are no exostoses.

Clinically, this syndrome has the following features:—(1) A greater or less immobility of the entire spine or a part of it, with no marked pain on pressure or percussion; (2) a backward bowing of the spine, especially of the chest region, causing the head to be thrown forward and the chin depressed; (3) a weakened condition of the muscles of the rump, neck, and extremities, often with a trifling atrophy of the back and shoulder-blade muscles; (4) a lowering of sensitivity, particularly of the skin branches of the dorsal cervical, and occasionally the lumbar nerves; (5) various irritation phenomena, as paræsthesiæ, pain in the neck and back muscles, especially in cases of long standing.

Popoff considers spondylitis deformans to be a "neuropathic curvature of the spinal column." Oppenheim believes the same disease to be of nervous origin. Beer contents himself by defining it as "rigidity of the spine."

The following cases have been selected as examples of the various types of spondylitis deformans, and I shall, further on, draw attention to the most salient features of each, with some suggestions as to clinical differentiation of the various types.

Case 1.—The patient was a man æt. 39, an agricultural labourer. *Personal history.*—Had scarlatina at 18; he recovered completely. There is a history of some physical strain about puberty, which made it difficult for him to carry weights for some time. Twelve years ago, pain started in the soles of the feet, first the right, then the left; swelling of the ankle joints followed, likewise the knees; his neck was not affected. He came to the hospital, and completely recovered. Five years ago, pain started in the back and cervical region, radiating upwards to the occipital region on both sides. This pain, with remissions and exacerbations, persisted for months, and his head became gradually bowed forward and his chin depressed, and he lost the power to raise it. He then developed a right-sided pleural effusion, which disappeared after aspiration. The cervico-occipital pains now returned, and were complicated by pains running down his arms. Great swelling then ensued, involving finger-joints, wrists, but not elbows. These joints gradually recovered, and he is now able to use his left arm freely; but his right arm is limited as regards the range of movement at shoulder, though no grating can be perceived in the joint. His spinal column, however, is now perfectly rigid. He cannot raise his head, and rotation is impossible without movement of the whole column. When lying on his back, his spine cannot be made to touch the bed at all points. If his head and neck be depressed, the lower part of his spine becomes elevated, and *vice versâ.* There is some slight lateral curvature to the right of his dorsal spine. His thoracic movements are almost entirely absent, owing to fixation of his ribs, and his breathing is wholly abdominal. His right lung appears to have expanded completely; no moist sounds or friction, and no sounds of thickened pleura. His heart sounds are normal. His liver seems pushed down to a point below the right costal margin. He has developed during his illness a right inguinal hernia. There is a moderate degree of muscular atrophy, which appears to be general in distribution. His tendon reflexes in upper extremities are brisk, likewise the knee and Achilles jerks; no ankle or clonus or Babinski. He suffers severe paroxysmal pain along his sciatic nerves. There are no areas of altered sensation. Urine normal.

The following case of spondylitis I have reported because of the associated widespread vasomotor phenomena, which affected not only the extremities, but also the face, likewise the genital organs.

Case 2.—The patient was a male about 40 years of age. There was no history of any previous illness. The existing condition was of seven years' duration. It began with attacks of local syncope and asphyxia, affecting the ring and middle fingers of each hand, which afterwards became the seat of fusiform joints. The little finger has never been affected, but the index has latterly been invaded by the same phenomena. The vasomotor changes extended some way up the dorsal surface of the forearm, and were followed by localised sweating over the affected area. The same sequence of vasomotor phenomena, followed by joint swellings, occurred in the lower extremities, affecting especially the right knee, ankle joint, and toes. Both in the upper and lower extremities, radiating pains were complained of shortly before joint swellings appeared.

Later on, cervico-occipital pains became a feature, and likewise pain along the branches of the trigeminal, especially the supra-orbital. These soon became complicated by vasomotor phenomena affecting the right ear and same side of face. The conjunctiva was not exempt; it became injected, with intolerable itching and "fogginess" of vision. These fleeting obscurations of vision occur very commonly in those cases of arthritis deformans which are characterised by vasomotor phenomena. He also suffered with attacks of vertigo, which usually followed an attack of local asphyxia in either ear. In addition, his penis, scrotum, and to a slighter extent his buttocks, were subject to attacks of local syncope and asphyxia. He suffered from chilliness and strangury on these occasions, and his urine became very dark and brown in colour. Unfortunately, owing to the carelessness of a nurse, I was unable to examine for hæmoglobinuria. Such a condition has been met with by more than one observer in this vasomotor type of arthritis deformans. There is only a moderate degree of muscular wasting, and in this respect this case contrasts strikingly with Case 4. There was considerable thickening and induration of the cervical muscles, and his head was fixed. There were no permanent sensory alterations. The large joints of his lower extremities had been affected, especially those of the right limb.

Case 3.—The patient was a youth æt. 18. He was said to have had an attack of rheumatism when four years of age. This present illness began in 1896. It came on gradually, beginning in the extremities. The first symptom noticed was stiffness in the fingers, with great pain on movement, and weakness of grip. Swelling of the joints of middle and ring fingers followed; also wrists and elbows, especially the right. He suffered greatly with pain along the inner side of arm and forearm, more especially on the right side. The skin over this area was very hyperalgesic, and felt "sore." It corresponded with the area of distribution of the internal cutaneous nerve. On the dorsum of the forearm, just external to this area, was a narrow strip extending downwards over the ring and middle fingers, corresponding in its upper part very closely with the distribution of the external cutaneous branch of the musculo-spiral. Over this area sensation and pain were much diminished, and the fingers referred to were apparently analgesic. His wrists became permanently flexed, also his right elbow; but his shoulders were movable. The same cervico-occipital pains that characterised the involvment of the vertebral joints in the previous cases were also present, and gradually his head became bent forward, with depressed chin, and remained fixed in that position. The affected cervical and upper dorsal vertebræ were extremely tender, and he complained of "soreness" of the skin in front of chest over the first three intercostal spaces, especially on right side. The pupil on this side was smaller than the opposite. In the lower extremities the disease came on gradually, with pain along outer side of legs, running into sole; his ankle joints became swollen, and a condition of "flat foot" ensued; his knees and hips also became affected. The deep reflexes in both upper and lower extremities were exaggerated. There was moderate general muscular atrophy.

Case 4.—The patient was a man æt. 38. He had suffered with rheumatic fever when 14 years of age. He had two subsequent attacks, one at 26 years of age, when his spine became rigid, and another when 36 years old. In order to avoid useless repetition, I would draw attention only to the salient features of the case. First, the widespread implication of the spinal column, and of the joints of the limbs, both shoulders and hips; both elbows fixed in mid-flexion. His wrists and fingers, however, escaped. His knees and ankles were affected. He was totally unable to raise himself into a sitting posture. Secondly, the marked general muscular atrophy, with great exaggeration of the tendon reflexes in upper and lower extremities.

General Remarks.—*Etiology.*—We possess little or no definite knowledge on this important point. Influenza and other infectious disorders have been supposed to be casually related in some obscure way. Bamnler, Marie, and others believe that gonorrhœa is responsible for some, and certainly one meets with a history of it every now and again. In this connection it is, I think, important to remember that recent research has shown us that infections, other than syphilis and tubercle, may attack the vertebræ. Infective spondylitis would appear to be commoner than has been thought. Many different organisms may infect the medulla of the vertebræ; pneumococci, staphylococci, typhoid bacilli, and others have been found. Broadly speaking, these cases of infective spondylitis fall into two groups, the suppurating and the non-suppurating varieties. This last type is evidenced by pain and swelling over the affected vertebræ, usually the lumbar, with sensory and motor phenomena in the lower extremities.

These bacteriological findings seem to me to support the view that some of the infectious disorders may be etiologically related to spondylitis deformans.

Chenine, writing on this subject, considers that in the light of these facts great care should be exercised during convalescence from infectious disorders, in avoiding strains or injuries of the back.

Wilks, as we know, attached great importance to the mechanical factor in spondylitis, and has described the same lesions in "labourer's spine."

In two of the cases here related there was a very definite history of a previous injury to the back.

Fagge described a case where such a condition of the spine was caused by tuberculosis.

In this connection it is, I think, interesting to note the occurrence of pleurisy in some cases. Without laying any undue stress on this factor, it must be remembered that Poncet and his pupils have endeavoured to show that some cases of arthritis deformans are of a tuberculous nature.

Hoffmann relates a case in which severe acne of the back was followed by spondylitis, and following the successful treatment of the acne, the spinal symptoms disappeared. He therefore believed the disease to be of toxic origin. I recollect the case of a nurse in whom an abscess in the back was followed by generalised rheumatoid joints without any special involvement of the vertebræ.

In one of the cases here described, aggravation of the condition followed otorrhœa. If one were to include the cases with only slight involvement of the vertebræ, one would find that the etiology of spondylitis deformans was as varied as that of arthritis deformans.

History.—The history of these few cases shows that it is impossible to sharply divide the vertebral from the polyarticular types. Cases may begin as a polyarticular arthritis, and, either subsequently or coincidently, the vertebral joints become involved. The further course of these cases is variable. In some with early spinal involvement, the vertebral joints recover mobility, and the disease may linger on in the joints of the limbs. In others the joints of the limbs recover, leaving the vertebral joints permanently ankylosed, and this immobility may affect the whole or only a portion of the spine.

Dr. M'Crae also relates cases preceded by polyarticular outbreaks. Again, there is, I venture to think, no advantage to be gained by subdividing spondylitis into the so-called Strumpell-Marie and similar types. That such cases do occur is unquestionable; but does a classification based upon such a superficial difference as the anatomical distribution of the lesions help us much? The involvement of the joints in spondylitis is so variable, that endless types might be constructed on such a basis.

Possible coexistence of the rheumatoid and osteo-arthritic types.—I have long since being struck by the fact that in one and the same patient some of the joints may be of the rheumatoid type, others of the osteo-arthritic. By rheumatoid, as opposed to osteo-arthritic, I mean that in the former the morbid process is confined largely to the synovial and soft tissues. I reported some time in this Journal a case in which the knee and hip showed osteo-arthritic changes, while the finger joints were the seat of the ordinary periarticular swellings. M'Crae, writing on spondylitis, has noted this fusion of the two types in some of his cases. Personally, I am inclined to agree with those who regard osteo-arthritis as a terminal condition in many chronic joint conditions, and it would seem probable that this condition may be arrived at by, so to speak, different pathological routes. We have evidence that hæmophilic joints may pass into this condition, likewise gouty; and I see no reason why rheumatoid joints may not under certain conditions pass into osteo-arthritic. If such a transition is possible, then it is not improbable that the two stages may occasionally be observed in one and the same patient. Recently a case of osteo-arthritis has been reported, where degeneration was present both in the cord and the peripheral nerves, and in a former contribution to this Journal I expressed a belief that this osteo-arthritic change might be trophic in origin, namely, secondary to chronic spinal toxæmia.

Is it not possible that these cord and nerve lesions may be responsible for this possible transition of the synovial into the osteo-arthritic types? It seems unreasonable to imagine that such grave central changes would not leave their impress on the clinical picture. Again, we know how proverbially difficult it is to distinguish microscopically between toxic and degenerative cord lesions. If such close similarity obtains as regards their pathological appearances, is it not very likely that the same close resemblance will be extended into their clinical manifestations?

Even as regards the arthropathies of tabes, Jurgens has adduced evidence that even in the absence of obvious arthropathies marked changes may be present in apparently healthy joints of tabetic patients, such as hyperæmia of the synovial and softer structures, which he attributed to vasomotor disturbances of central origin. This being so, it seems to indicate that the fulminant onset of arthropathies is more apparent than real, that there is a prior stage in which the changes are confined to the synovial and soft tissues. Again, though the chronic spinal arthropathies are attended by bony changes, one must remember that in the more acute spinal arthropathies, such as occur in myelitis, etc., the changes are largely confined to the synovial and soft tissues. Have we not here something analogous in the synovial and osteo-arthritic types of arthritis deformans?

Certain general clinical features.—It will have been noted that widespread muscular atrophy was present in one of the cases here reported, and that this feature distinguished it, so to speak, from the others.

The most salient characteristic of another were the severe and extensive vasomotor phenomena, and in two of the cases sensory alterations were present.

I have emphasised these so to speak accessory clinical phenomena, because one meets with exactly the same differences in cases of the polyarticular types, and also because I believe that these clinical peculiarities will eventually be found due to the fact that different etiological factors are responsible for the production of arthritis deformans in different cases. Granting, for instance, that the disease is of toxæmic origin, is it not likely, considering the varied etiology of arthritis deformans, that different toxins may be responsible in different cases? If so, in all probability such different toxins will exercise a selective affinity, one for one tissue, one for another, and this may account for the seemingly capricious manner in which these accessory clinical features manifest themselves.

We have an analogy in other diseases of known toxic origin. Take multiple neuritis. A strong family likeness runs through all the types, but each has its own peculiar traits. The diphtheritic differs from the alcoholic, the alcoholic from the saturnine, and saturnine from the arsenical, and so on. Why should not the same differences obtain in the varied types of arthritis deformans?

Many authorities have from time to time laid stress on pains of spondylitis deformans, and, on the other hand, too little stress has been laid upon their occurrence in the polyarticular types. Believing as I do that they are equally severe in both types, I would state in advance that I have met with the following clinical features in both forms.

In the following remarks on the pains of arthritis deformans, I shall deal only with those pains experienced in the continuity of the limbs as opposed to arthritic pain dependent on local joint changes.

Trousseau laid great stress on such a differentiation of the pains of nodular rheumatism.

The first point I would draw attention to is the fact that pain of a radiating character is often an early symptom of arthritis deformans. It has long been recognised that sciatic pains may precede an outbreak of rheumatoid joints in the lower extremities. This fact, that the pains may precede by some considerable time the appearance of joint swellings, cannot be too strongly emphasised.

In the case of a young woman I saw some time since, sciatic pain, followed by rheumatoid swellings, occurred. The pain was accompanied by the appearance of an extensive purpuric rash along the back of the thigh, also along the front and outer side of leg. I have also seen an extensive herpetic eruption over much the same area, but in this case joint swellings were previously present. Spender noted that herpetic eruptions may accompany the paroxysmal pains of rheumatoid patients.

Now, while, as I have said before, stress has been laid upon sciatic pain as a possible precursor of rheumatoid swellings in the lower limbs, too little importance has, I think, been attached to similar radiating pains in the head, neck, and upper extremities.

Dealing first with the cervico-occipital pains. These usually are of a dull, aching character, with local tenderness over the affected vertebræ, usually the lower cervical and upper dorsal. From the spine, pains, variously described as shooting, stinging, etc., pass upwards to the occipito-parietal region of the scalp, and in many cases outwards over the trapezoidal region of shoulder. They may be unilateral or bilateral, but usually are more severe on one side. These pains are followed by hyperæsthesia, and more particularly hyperalgesia of the skin over the painful area. The extent of this area is variable: it may extend down along the skin of the back as far as the angle of the scapula, or in some cases only the skin over the nape of the neck may be affected. Most commonly the area of tenderness extends from the edge of the hairy scalp down over the neck, along the supra-scapular region to the shoulder. The tenderness may be exquisite, even the pressure of garments is intolerable in some cases. This hyper-sensitiveness is often followed by a temporary dulling of sensation, especially as regards pain stimuli.

In some the thermal sense is much modified; in a few it has appeared temporarily absent. The difference in reaction of patients to objective painful or thermic stimuli as one passes from painful areas to neighbouring unaffected areas of skin, is very striking.

The commonest way of describing the tenderness of the skin is to compare it to a "bruise." Pinching up the skin, even lightly, seems peculiarly objectionable. Dermographism is often easily elicited over these areas.

During the stage of hyperæsthesia the scapular reflex may be much increased, and contrasts strikingly with the reflex on the opposite side. The same sensory alteration is found over the occipito-parietal region of the scalp on the affected side. Women find themselves unable to bear the insertion of hairpins or any tension on their hairy scalp. In the same way numbness and sweating often follow, and loss of hair is frequently complained of.

In some cases, in addition, pain over the trigeminal area is complained of, affecting especially the supra-orbital region, and fleeting obscurations of vision are met with, and sometimes constricted fields of vision. The head is generally inclined to one or other side, sometimes bent forward, with depressed chin. It is held very stiffly, all attempts at movement being avoided. In many cases the cervical muscles become tender and swollen, and the glands enlarge. In some cases of long standing the muscles become indurated and of bony consistence. In some Bouchard's nodes have been noted. There is one interesting point about the area of tenderness above referred to. It sometimes extends downwards and forwards from the nape along the side of the neck to the subclavicular region. It may be complained of subjectively in some cases; in others I have found it by objective testing. In one case where the tenderness was marked, I noted that the ciliospinal pupillary reflex was much brisker on that side. Rotation of the neck in these cases calls forth a synovial creaking quite different from the coarse grating heard and felt in the advanced cases. Such attacks as those just described may last for weeks, with exacerbations lasting a few days. Many of the polyarticular cases suffer with them and recover completely. On the other hand, the persistent recurrence of these attacks is a very early and very frequent feature of the vertebral type. The condition of "poker back" is only arrived at very gradually, and the constant repetition of these attacks, each attack leaving behind it increasing limitation of movement, gradually produces ankylosis. Should the radiating pains pass down the arms, they are often followed by swelling of the joints of the limbs. In some cases the pain radiates along the inner side of the arm and forearm to the little finger and inner side of the hand. In such cases I have noted that there is a tendency to swelling of the wrist or joints of little finger.

Lately I saw an interesting case of the polyarticular type in a young girl, who also had an enlarged thyroid with a pulse rate of over 120. She suffered severely with pain along the inner side of forearm and hand. It was followed by an extensive crop of herpes, extending chiefly over the eighth cervical and first dorsal areas of head. In addition, there were present signs pointing to affection of the cervical sympathetic on the same side, namely, enophthalmos pseudo-ptosis, with a contracted pupil. This, as we know, may be produced by any affection of the eighth cervical and first dorsal nerve roots, if such lesions affect the roots at any point before they give off their rami communicantes. Again, in other cases the pain radiates along the outer border of the forearm, usually passing to the index and thumb. Spender drew attention to this pain, and termed it "characteristic." It often precedes swelling of the phalangeal joints of the thumb and index finger.

An interesting point is the tendency of the superior and inferior radio-ulnar articulations to become affected quickly afterwards. In such cases the elbow is flexed and adducted to the chest wall, the forearm is pronated, and the wrist supported by the pillow or opposite hand. The skin over the bicipital muscles may become very sore, and great swelling of these muscles may occur.

Anyone who sees many rheumatoids will have noted how soon their power of supinating the forearm is limited, though flexion of the wrist and elbow may apparently not be affected. I mention this curious sequence because I believe it may prove helpful.

I once was consulted by a lady who had been treated for what was thought to be a sprained wrist, the forearm and wrist having been kept to rest by a splint. On examination, I found some puffiness of the wrist, closely resembling a teno-synovitis, as it often does in rheumatoid disease of this joint; but on gentle rotation of the forearm I was able to detect definite creaking in the superior radio-ulnar articulation.

Finally, in some cases great pain is experienced along the dorsum of the forearm and hand, radiating to the middle and ring fingers, which may precede fusiform swelling of the joints of these digits. It is over this dorsal area of the skin of the forearm that I have met in a few cases with persistent anæsthesia.

This pain is often accompanied by painful flexor spasm of the fingers.

On the other hand, in cases where the pain radiates into the index and thumb, as before described, there is often a tendency to extensor spasm, or, as patients term it, a "stiffness," which they may have to overcome by pressure.

In addition to the associated symptoms, muscular cramps and sensory changes, vasomotor phenomena, local syncopes, and asphyxias may occur. In one of the cases described they were unusually widespread. Macalister of Liverpool has recently emphasised the importance of recognising these muscular cramps and vasomotor phenomena as possible early symptoms of arthritis deformans.

In long-standing cases the painful areas may show large atrophic, glossy white patches of skin, sometimes edged by areas of dark brown pigmentation. In cases with intercostal pains of a girdle type, I have noted that pigmentation has followed. In one case I saw trophic ulceration follow severe pain in both legs (outer side). The pain and ulceration were symmetrically placed.

That grave trophic ulceration may occur in arthritis deformans is shown by Macalister, who has met with several cases, in one of which perforation into the knee joint occurred. Similarly, in the lower extremities pain may precede an outbreak of rheumatoid joints. In this connection, it is, I think, worthy of note that Brissaud has pointed out that arthropathies occur more frequently in the sensory types of tabes, namely, those with severe "lightning" pains. In my own experience sciatic pain more often precedes swelling of the ankle joints.

A recent writer, treating of sciatica, states that it is frequently associated with osteo-arthritis of the hip joints. M'Crae believes it not improbable that a local arthritis of the lumbar spines may be responsible for sciatic pain.

As regards affection of the knee joints and any asociated pain, I have noted that patients often complain of subjective pain and soreness over the outer side of the leg on the affected side. My attention was drawn to it by observing the way patients rubbed this portion of their legs when the knee was affected. They also usually complained at the same time of "cramp" or a feeling of tightness over the insertion of the hamstrings. In other cases the subjective pain followed along the crest of the tibia. It is, however, interesting to note that the skin over the outer side of the leg may undergo sensory alterations. Such sensory alterations are similar to those described before, and, like them, are usually fleeting, but in some cases permanent alteration occurs. I have seen complete anæsthesia over this area—one case was seen by me with Mr. J. R. Benson of Bath; others have also noted anæsthesia over this same area. Electrical testing was employed.

The outer side of the leg is also, in my experience, a common site for gross trophic changes in the skin, which may become perfectly smooth, ivory white, and devoid of hairs. Neighbouring areas may sweat, and this region remain perfectly dry, with a lowered surface temperature.

M'Crae lays great stress on the importance of testing for sensory alterations in spondylitis. While I endorse this statement, I would by no means confine the testing to cases of spondylitis, for such sensory alterations are equally important and at least equally common in the other types. Rührah, writing on referred pain in spondylitis, says: "It is felt in the nerve-endings, and not along the track of the nerve, as in neuritis. There may be areas of hyperæsthesia and anæsthesia."

This opens up the question as to the nature of these "rheumatoid" pains. One has to admit that in some cases the pain appears to travel centripetally, in others centrifugally. As regards the former type, the pain and sensory paræsthesiæ are very similar in character and distribution to those complained of in the early stages of multiple neuritis. Tingling and numbness, aching or sharp pains, either in soles or hands, with perhaps some slight dulling of sensation, giving rise to difficulty in performing the finer movements. In others a condition like acroparæsthesia is present, and such patients will complain greatly that contact of the tips of fingers with any surface causes pain to radiate up the arm. I have noted that such pains travel by the same paths as those previously described, only in a reverse direction. I myself have often endeavoured to associate rheumatoid pains with recognised nerve paths, but have usually failed, and other medical men have also informed me that they experienced the same difficulty. Many have asserted that they are due to pressure on nerve roots by bony outgrowths, but this does not explain their presence in other types than the vertebral.

In von Bechterew's type a meningitis is responsible, so he believes; and it is well to remember that some ascribe the lightning pains of tabes to a chronic meningitis of the pia involving the posterior nerve roots. If we incline to the toxæmic view of the origin of arthritis deformans, can we exclude a similar process in some cases of that disease? Again, one must remember that degeneration of the posterior nerve roots and columns has been observed in arthritis deformans, and this is a condition found in many chronic toxæmias. It seems not improbable that in different cases different pathological conditions may be present. In some cases neuritis has been observed; in others, cord and nerve lesions. In Foli's two cases of spondylitis, changes were found in the anterior cornua. Should a direct infection of the medulla of the vertebræ be responsible for some of the cases, a perimeningitis may be present in some instances.

Certain clinical features point to a segmental distribution of the pains. The distribution of the joint lesions in the fingers often follows a segmental type. This I suggested some years ago, and likewise that the reflexes tend to associated alterations of a segmental type. M'Crae, writing recently on the polyarticular type, states: "The association of the reflexes often follows their segmental distribution, as may also the curious localised distribution of the lesions in the hands. Thus the middle and ring finger only may be involved or show special changes. In another case the thumb and first finger may show the same association." In continuation, he says: "These may speak for primary spinal cord involvement, but the suggestion that they may be due to changes due to toxic substances seems worthy of note."

The areas of hyperæsthesia and anæsthesia in their distribution are very suggestive of a segmental type, whilst the tendency for certain paths of pain to be associated with spasm, and occasionally atrophy of segmentally related muscles, also points the same way. Further than that, in our present uncertain knowledge as to the pathology of the disease, we cannot go.

If the view that arthritis deformans is a nervous disorder be ever proved, it will, I venture to think, be found to be of central origin. Certain of the cases, with rapid muscular wasting, symmetrical involvement of the joints and increased reflexes, strongly suggest a central origin, as Osler suggests. It must, however, be granted, that neuritis only has been found in some cases. This variety in the pathological findings is what one would expect if the disease be of the nature of a toxæmia.

A glance at the pathology of nervous diseases of toxic origin, multiple neuritis, etc., shows us that no hard and fast line prevails. Peripheral and central lesions, or one only, may be present, in lead poisoning for example. It seems probable to me, therefore, that different lesions may be present in different cases of arthritis deformans, such differences being presumably due to selective action of different toxins for different portions of the nervous system.

The diagnosis of spondylitis deformans in the earlier stages is beset with difficulties. Take, for instance, a case involving the cervical vertebræ. Anyone who sees many such cases must have been struck with their close clinical resemblance to early cervical caries, or the initial stages of cervical hypertrophic meningitis, or even syringomyelia.

As regards his cases of spondylitis, M'Crae mentions that tuberculin was given in all with a negative result, but he considers it "a great help in the matter of diagnosis." He also relies on radiography, and states that "in all but probably the very early cases definite deposits of new bone can be made out."

I believe, personally, that there is a stage of spondylitis in which the morbid changes are confined to the synovial tissues of the intervertebral articulations, and that these, at this stage, present a marked clinical resemblance to those cases of von Bechterew, described by him as "stiffness of the spine." I am led to this conclusion by noting the great frequency with which patients recover perfectly their spinal mobility, notwithstanding the fact that they may have undergone attacks in every way similar to those obtaining in the early stages of those unhappy cases which eventually are complicated by bony changes. When one notes the coexistence of synovial (rheumatoid) types with bony or osteo-arthritic types, and couples with it the fact that some cases of spondylitis recover, one cannot help believing that in those cases which recover this is due to the fact that the morbid changes in the early stage are confined to the synovial tissues of the articulations, and that the synovial types may pass into the osteo-arthritic.

As regards pachymeningitis; are not the radiating pains with maybe patches of hyperæsthesia or anæsthesia and trophic skin changes, which often characterise early stages of cervical spondylitis, very similar to those obtaining in the early stages of cervical pachymeningitis? The difficulty is enhanced by the fact that the deep reflexes in the lower limbs are often increased in these cases of spondylitis, and occasionally ankle clonus is present. Again, we know that in pachymeningitis of this region, the resulting deformities differ according to the locality of the morbid process. If the upper half of the cervical region is affected, the musculo-spiral nerve supply is damaged, hence a flexed wrist. In one of my photographs this deformity is seen. In other cases the wrist may be more or less extended.

All these similarities indicate caution in diagnosis about this region, especially in view of von Bechterew's statement as to a meningitis being present in some of his cases. Rührah, in his exhaustive article, draws attention to this liability to confusion with pachymeningitis.

With regard to syringomyelia, Rührah, commenting on the spinal curvature so often found in this condition, states: "Indeed, there is considerable danger of mistaking some cases of syringomyelia for spondylitis if the former disease is not borne in mind." I myself reported a case in which syringomyelia had been confused with chronic rheumatism. There are also other similarities than curvature of the spine. Some cases of syringomyelia are characterised by great muscular atrophy, the amyotrophic type of Schlesinger, in which, moreover, the sensation may remain undisturbed for years, with increased reflexes. Is there not also a type characterised by marked vasomotor and trophic changes? and if we include leprosy, as some authors would, as a type of syringomyelia, we may possibly have another similarity, namely, a toxæmic mode of origin, and such has indeed been suggested. Similarly, some cases of arthritis deformans, as has been stated, may be characterised by great muscular atrophy and increased reflexes, an amyotrophic type.

In others, vasomotor phenomena and trophic disturbances are the salient features; even onychia may be present, as Osler states. I have had a case in which "painless whitlows" were a feature. This suggests a similarity to the Morvan type of syringomyelia. Again, it must be remembered that not only may dissociated anæsthesia be absent in syringomyelia, but pain may be a prominent symptom, while the former symptom has been met with in neuritis of nerve roots, pachymeningitis, and tabes. So again in arthritis deformans is the symptom pain very variable. Some suffer intensely, others find their vasomotor phenomena troublesome, or are more inconvenienced by muscular stiffness or weakness, and so on.

Alterations in the pupil are also fairly frequent in both syringomyelia and pachymeningitis, and such conditions pointing to lesions of the cervical sympathetic have been met with in spondylitis deformans, and what is, I venture to think, more suggestive, are to be met with occasionally in cases where the spine is not involved. A word of caution is here necessary. I once saw a case of arthritis deformans in which unilateral myosis was present. I asked Mr. Beaumont of the Bath Eye Infirmary to see the case with me, and on instillation of atropine the condition was found to be due to synechiæ consequent on old iritis, probably due to gonorrhœa, from which the man had suffered. Other symptoms of sympathetic origin, such as unilateral flushing, etc., one meets with occasionally. With regard to the spinal curvature of syringomyelia, it is still a matter of controversy, some ascribing it to deficient musculature, others, like Schlesinger, ascribe it to a local spinal arthropathy. I am not in the least suggesting that there is anything more than some general clinical similarity between syringomyelia and arthritis deformans.

Enough has been said to show that the nervous system is often profoundly affected in arthritis deformans. Whether or no the joint swellings are trophic, or due to a toxigenic synovitis in the first instance, must be left open. The accessory, trophic, sensory, and vasomotor phenomena may, I think, be fairly ascribed to nerve changes. Some attempt at cleavage is urgently needed if we would attempt to clarify our knowledge about the various joint affections grouped under that convenient, ill-defined term—"rheumatoid arthritis." Its boundaries are so shadowy that it bids fair to become a dumping ground for all alien diseases of the joints.

My own belief is that this desirable end will be attained soon, if, instead of focussing our attention upon the joints only, we take a more comprehensive view of the disease as a whole, recognising that the joint swellings are only one feature of this extensive clinical picture, and giving that attention to the correlated phenomena which their gravity demands. Even as we turn to associated sensory and motor phenomena to distinguish clinically between syringomyelic and tabetic arthropathies, so, I venture to think, shall we eventually learn to rely upon similar phenomena to enable us to distinguish between the various types of arthritis deformans.

To use a Platonism, "We have unity yet have we variety" in arthritis deformans.

THE IDENTIFICATION AND AUTOPSY OF THE BODY OF PAUL JONES ONE HUNDRED AND THIRTEEN YEARS AFTER HIS DEATH.

The following account by MM. L. Capitan and Papillault of the discovery and identification of the body of Paul Jones after burial for a hundred and thirteen years, is so interesting that we need offer our readers no apologies for reproducing it from the pages of the *Revue d'École d'Anthropologie,* tome viii., 1905.

Amongst the eminent ancestors of Americans of the United States, ancestors who, naturally, are not yet very old, there was one who died in Paris at the end of the eighteenth century, and whose body it was earnestly desired to discover, in order that it might receive the honour due to it, and be carried back to America to a national sepulture and resting-place worthy of it. The body thus coveted was that of the illustrious Admiral Paul Jones, the father of the American Navy.

For many years the United States Ambassador, General Porter, and Colonel Bailly-Blanchard, Secretary to the Embassy, had been actively engaged in trying to discover the body of Paul Jones, about whom we shall in the first place recount one or two historical facts.

Born in 1747 at Arbigland (Kirkcudbrightshire), Paul Jones, having taken service in the American Navy, received from Congress the command of a squadron which was sent against Great Britain. In 1779 he fought a desperate action, in which he captured two British men-of-war, and for this Louis XVI. presented him with a gold-hilted sword of honour. After peace was declared, he entered the service of Russia, and, being made Rear-Admiral by Catherine II., he set out with Potemkin for the Black Sea. Here he quarrelled with Potemkin, and had to resign his commission. He lived for some time in Holland, then in Sweden, and finally came to Paris, where he was received by the National Assembly. He was unable to reply on this occasion to the address which the Assembly offered him, owing to a pulmonary affection from which he was suffering. He succumbed some time afterwards to a disease to which we shall refer later. He died in Paris in 1792, and was buried on the 20th of July (according to the burial register found by Charles Read prior to the acts of incendiarism of 1871) in the cemetery for foreign Protestants in the Rue Grange-aux-Belles.

Colonel Blakden, an old friend of Paul Jones, wrote a letter to the Admiral's sister, Mrs. Taylor, which is still extant. In it he told her that he had placed the body in a leaden coffin, and had adopted all the necessary precautions for its transport when his country should claim the return of the remains of such an illustrious son.

Blakden did not imagine that a hundred and thirteen years would elapse before the realisation of his hope, or that the identification of Paul Jones would have to be scientifically established before a national funeral could be given to him.

As it was not exactly known in which part of the cemetery Paul Jones had been buried, it became necessary to carry out a systematic search. The site, which was correctly indicated by Verniquet's plan, had become covered with buildings, and the search had therefore to be proceeded with by means of subterranean galleries, directed in such a manner as to enable the whole area to be thoroughly examined.

General Porter obtained the permission of the Prefect of the Seine for a competent staff under the direction of M. Weiss, mining engineer, being placed at his disposal. M. Weiss, at a depth of sixteen feet, made more than 250 yards of subterranean passages six feet square. He encountered numerous human skeletons, a stone vault, but only a few leaden coffins. The first of these bore the date 1790; the second was that of George Maddison, Secretary of Embassy; the third that of Richard Hay, who died in 1785; a fourth contained the body of a tall man whose heart had been enclosed in a leaden urn, and whose viscera were also contained in a separate leaden vessel; finally, a coffin was discovered which presented distinctive characters. At a depth of about sixteen feet, beneath a house, two coffins, placed one above the other, and misshapen owing to the pressure of the earth above them, were found.

The uppermost contained a skeleton in a bad state of preservation.

The lower one had been originally enclosed in a wooden shell, of which the débris still remained. Contrary to the usual custom, it bore no designation. It is probable that the gravediggers, when they were burying the uppermost coffin, removed the nameplate which ought otherwise to have been present on the lower one. On the upper surface of this coffin, near the level of the head, a small orfice, which apparently had been subsequently soldered, was observed. On making a small opening in the coffin at its upper end, and after removal of the straw surrounding the body, a head, covered with hair, mummified and perfectly preserved, was seen.

General Porter was immediately informed, as well as Colonel Bailly-Blanchard, second Secretary of the United States Embassy, and his active collaborator in the investigation. Suspecting that this was the body of Paul Jones, these gentlemen asked for our assistance in establishing the identity by anthropological means, since there was little probability of effecting this in any other way.

By the courtesy of M. Lépine, Prefect of Police, the coffin was transported in the most absolute secrecy to the School of Practical Anatomy, in which M. Reiffel afforded us accommodation. Here, on the 9th of April, the leaden coffin was opened in the presence of Colonel Bailly-Blanchard, representing the Embassy, M. Weiss, and ourselves. The body was packed in straw, which completely enveloped it. This straw, of a brownish-black colour, was soaked with the same liquid as that with which the body was impregnated. The corpse was in an excellent state of preservation, presenting the appearance of a dark brown mummy, but with the soft parts still soft, and far from being dried up like those of a real mummy. The appearance and smell reminded one of an old anatomical preparation which had been preserved for a long time in alcohol. The corpse was clothed in a linen cap and shirt, surrounded by a shroud.

On careful examination, Mme. Weiss discovered on the front of the shirt a mark formed by the letters J and P, combined in a monogram which might cause it to be deciphered in either way.

The hair all over the body was in a good state of preservation, and the soft tissues possessed the consistence of indiarubber.

Owing to this latter circumstance, we were enabled to straighten the nose (which had been laterally distorted by pressure) and to distend the nostrils, so as to enable our friend Monpillard to take some excellent photographs.

In the identification based upon physical characteristics, two sources of information were employed, namely, certain historic details as to the appearance of the Admiral, and, secondly, two of his busts, both of which are attributed to Houdin. We shall now therefore investigate these two sources of evidence.

I. Historical Evidence.—This is unfortunately very scant. It is known that Jones died in his forty-fifth year, that his hair was brown, and that his height was 67 in. (1·70 metre).

These statements were corroborated by the examination of the body—the brown hair, the state of the teeth, the presence of a few grey hairs indicating that adult age had been attained. As regards the height, the importance of which as a means of identification does not require to be accentuated, it was found to be $67\frac{2}{5}$ in. (1·71 metre), or two-fifths of an inch in excess of the height referred to above. As a matter of fact, even in the absence of a historical reference to the point, it is more than probable that the height of the Admiral was measured while he was in the upright position, and thus the recumbent posture, owing to the straightening out of the curves of the spinal column and the accentuation of the arch of the foot, would tend under any circumstances to increase the height by at least two-fifths of an inch.

To summarise, therefore, the documentary evidence and our observations corresponded in a most satisfactory manner.

II. THE HOUDIN BUSTS.—One of these belongs to the Marquis de Biron and the other is in the Philadelphia Museum. A replica of the latter is contained in the Trocadero Museum.

We did not utilise the bust belonging to the Marquis de Biron, because it shows a certain carelessness in the modelling, and further, it is not full size. The one at Philadelphia, on the other hand, is a masterpiece of life and likeness. The comparisons which we instituted with this bust were of two sorts. The one set dealt with the morphological characters, which have little dependence upon the soft tissues; the other was based upon measurements.

1. *Morphological characters.*—The implantation of the hair on the scalp, the form of the forehead, the prominence of the superciliary ridges, of the malar bone and of the root of the nose, the prognathic characters of the face in general and in particular of the lower jaw, form of the chin, exact form of the aural cartilages, —all these regions, when compared with the greatest care, demonstrated a most striking resemblance.

2. *Mensuration.*—We were able to take six measurements, which were strictly comparable on the bust and on the mummified cadaver, and these were—

	Philadelphia Bust.	Corpse.
Length of the face (root of the hair to the chin)	19·5 cm.	19·5 cm.
From the roots of the hair to the subnasal point	12·7 „	12·9 „
From the subnasal point to the chin . .	7·5 „	7·4 „
Length of the upper lip (from the subnasal point to the margin of the superior incisor teeth)	2·4 „	2·5 „
Length of the lower lip and chin . . .	4·6 „	4·6 „
Minimum breadth of the forehead . . .	10·4 „	10·2 „

The similarity of these results is quite extraordinary. They are sufficient in themselves to identify the subject, because the variations of the human face are enormous. In a head of a given size every part of the face can vary by at least one-fourth. We will not go into the mathematical question of probabilities, since we are convinced that it is useless in dealing with biological problems. We would rather cite the following fact, which will demonstrate more convincingly the value of our observations: In 100 adult male bodies taken at random, we scarcely found a dozen in which the height corresponded to that of Paul

Jones within less than four-fifths of an inch. Three only had brown hair. In these three every dimension of the face varied. One can therefore easily understand what a large number of bodies would be eliminated by an exact correspondence of these six measurements of the face and by the morphological data investigated.

Incidentally, we may call attention to the methods of work employed by Houdin, which surpassed in precision that of any other sculptor, ancient or modern, so far as can be vouched for by one of us (Papillault). Finally, clinical experience and a knowledge of pathological anatomy afforded us a third source of evidence.

It is a well-known fact that Paul Jones suffered on several occasions from serious pulmonary symptoms, more especially towards the close of his life, and that these symptoms were chiefly localised to the left lung. Thus it happened, as we have already mentioned, that in consequence of this pulmonary trouble he was unable to reply to the address presented to him at a sitting of the National Assembly.

Documents of this period refer to the fact that towards the close of his life he suffered from "l'hydropisie du poumon gauche."

Some time prior to his death, also, he suffered from dropsy of the lower limbs, which began at the feet and afterwards ascended to the abdomen, thus indicating the existence of serious disease of the kidneys.

At the post-mortem examination the viscera were found to be impregnated with an alcoholic fluid, they were shrunken, of a brownish colour, and presented the appearance of anatomical preparations which had been preserved in spirit for a long period. We found, first of all, some pleuritic adhesions, especially of the left lung, to the costal pleura. On section, both lungs, but chiefly the left, showed small indurated areas, having all the appearances of patches of broncho-pneumonia. Both in the interior and on the surface of the two lungs there were a large number of hard whitish masses, which varied in size from a millet grain to that of an ear of corn, and which we were inclined at first to regard as tubercular nodules. This view, however, we at once discarded, owing to their presence also on the lower limbs, and we shall indicate their true nature later.

With regard to the kidneys, over and above any shrinking which might have resulted from maceration in alcohol, they appeared to us to be much smaller than normal, and they conveyed the impression, which was immediately expressed by one of our number (Capitan), that they were affected with interstitial nephritis.

It thus became of importance to examine the organs histologically, and accordingly Professor Cornil, with his usual courtesy, agreed to make sections, and to report upon the conditions present. He obtained some remarkable preparations, which have been admirably photographed by our friend Monpillard.

To our astonishment, as well as to his own, Professor Cornil reported that the results obtained were practically identical with those which might have been afforded by the organs at an ordinary post-mortem examination.

In the sections of lung tissue one could see small areas, deeply stained, and surrounded by zones of sclerosed tissue, and possessing all the appearances characteristic of areas of chronic bronchopneumonia. Professor Cornil searched in vain for giant cells as well as for tubercle bacilli by the usual staining methods.

The kidneys showed a large number of small circular areas, surrounded by zones of sclerosis, which corresponded with degenerated glomeruli. The walls of some of the blood vessels were thickened.

There was thus evidence of an advanced chronic interstitial nephritis. The liver was healthy, and afforded beautiful sections. Lastly, an interesting point may be referred to in connection with the histological examination.

On the surface of the skin, as well as of the viscera, but more especially on the lower limbs and surfaces of the lungs, small white firm masses were observed. These proved on examination to be masses of crystals formed in the bundles of delicate needles characteristic of tyrosine, and also small round bodies, consisting probably of leucine.

In order to explain the production of these crystals, we must suppose that between the time when the body was placed in the alcoholic preserving fluid, and the period when the fluid had become imbibed into the various viscera, a sort of autolysis took place in the interior of the organs, which, in a manner similar to the digestion of albuminoid matters by diastases, gave rise to the formation of tyrosine.

This interesting observation is worthy of being recorded along with the curious facts, wholly unexpected it must be admitted, which the post-mortem examination on this historic body revealed. As we have seen, the results of the histological examination were in complete accordance with the clinical symptoms present during the last years of Paul Jones's life.

From the many proofs afforded, anthropological as well as anatomical, we are entitled to conclude that the body examined was that of Admiral Paul Jones. We believe it is the first time that the identification of a body has been established by such diverse methods at a period of a hundred and thirteen years after death. Without our scientific proof these illustrious remains would have lain anonymous and unknown in the old cemetery of the Rue Grange-aux-Belles, and Paul Jones would not have been carried back to the land of his adoption, to receive there almost an apotheosis and a national sepulture.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

The Theory and Practice of Medicine. By Frederick T. Roberts, M.D., F.R.C.P. Tenth Edition. 2 vols. London: H. K. Lewis.

This well-known text-book, although it appears in the familiar binding, has been revised and re-written so thoroughly as to form practically a new book. The arrangement of the contents will be found in places to differ materially from that of other text-books, the author preferring to adopt a clinical, rather than a pathological classification of disease.

Under separate headings, such as "Dropsy," "Clinical Thermometry," "Hæmorrhage," and many others, much valuable miscellaneous information is contained in the ninety pages devoted to the general introduction.

Under the diseases of each system, Dr. Roberts gives an account of the general symptoms and physical signs, before proceeding to discuss those of each special disease. Throughout both volumes Dr. Roberts has succeeded in making his own personality felt, and where some authors would occupy space in discussing conflicting hypotheses and methods of treatment, Dr. Roberts gives us his own personal experience, which is infinitely more valuable and less perplexing to the average student and practitioner of medicine.

With hardly any exceptions, the work is thoroughly up to date. Some reference might have been made to opsonins in the section on "Acute Specific Fevers and Allied Diseases." Page 591 we suspect was written during the late Boer war, and escaped revision. If so, the "obvious reasons" why South Africa is not suitable for consumptives have now been removed, but the author does not mention the lasting difficulty of the patients obtaining suitable food. The "Glandular Fever" of Dawson Williams has been deemed worthy of a separate heading. The author has strong views as to the proper treatment of acute rheumatism, and here, as throughout the book, the lines of treatment are described with clearness, and the rationale of the various steps and methods explained.

Throughout the book but few references are given to the literature, and Dr. Roberts appears purposely to avoid statistics. We must, therefore, take it that it is from his own personal experience that he states that in acute rheumatism in adult life, there is "no material difference between the two sexes," and that in malignant disease of the œsophagus the middle part is involved "only very exceptionally."

Hypotheses of outstanding importance, such as those of Koch and von Behring on "Tuberculosis" and Pavy on "Carbohydrate Metabolism," are described at length, but in all matters still *sub judice* Dr. Roberts shows no personal bias.

The sections on "Diseases of the Thoracic Organs" are, as we had reason to expect, wholly admirable. It is interesting to note that Dr. Roberts considers the schoolboy's "stitch in the side" to be due to a limited dry pleurisy, the effects of which may be evident at a later period of life. "Within due limits," the author considers Cantlie's advice to encourage muscular exercise after an attack of pericarditis, with a view to loosening adhesions, well worthy of attention.

Gastro-enterostomy is advocated for cases of intractable chronic gastric ulcer which, after a fair trial, have resisted medical treatment.

"Diseases of the Nervous System" are dealt with in some 350 pages. The author states that Babinski's sign may be met with in functional paralysis, and holds that paralysis agitans is a functional disease. In posterior basic meningitis he states that only 10 per cent. of cases are said to recover. A good description is given of subacute combined degeneration of the spinal cord.

Illustrations are confined to temperature charts, and a few drawings of urinary deposits and vegetable and animal parasites, there being excellent micro-photographs given of the parasites of malaria. These last are taken from Dr. Spitta's book. An index is attached to both volumes, but might with advantage be fuller.

If the book has a fault, it is that it is too solid and in places makes hard reading. We congratulate Dr. Roberts on producing an excellent, sound, and comprehensive treatise on the "Practice of Physic," which will undoubtedly add to his already great reputation.

The Diseases of Children, Medical and Surgical. By Henry Ashby, M.D., F.R.C.P., and G. A. Wright, M.B., F.R.C.S. Fifth Edition. London: Longmans, Green, & Co.

Dealing as it does with both medical and surgical affections, there is probably no more comprehensive treatise on the diseases of children than this well-known text-book, now in its fifth edition. It is an eminently serviceable book, the allotment of space among the various subjects having been decided almost entirely by their practical importance. We are sometimes tempted to regret this, and to wish that the authors had given more space to the less known and rarer maladies of children. But the book is written for practitioners, and from this point of view it assuredly fulfils its object.

Passing to details, under the treatment of melæna neonatorum, adrenalin is not mentioned, yet it is now our sheet-anchor in treating these hæmorrhages in the newly-born; nor is there any word of the value of saline injections in the collapse of acute diarrhœa. Most will concur in Dr. Ashby's guarded estimate of the efficacy of phosphorus in rickets. The enhanced danger of bronchitis in children suffering from laryngismus is mentioned; it might also have been noted that marked facial irritability has, though in a minor degree, somewhat the same significance. The best treatment of laryngeal papilloma is still *sub judice*; we are glad to read that the authors favour tracheotomy, and trust to the spontaneous disappearance of the tumours. In the chapter on syphilis, attention is drawn to the fact that exfoliative dermatitis in the newly-born child is non-syphilitic; the error of supposing it to be a manifestation of the disease is far too common. The cerebral symptoms of syphilis in young infants are minutely described, particularly the occurrence of Jacksonian epilepsy followed by imbecility. We are inclined to agree with the authors' low estimate of the diagnostic value of Kernig's sign. In the account of eclampsia it is said that the prognosis must be very guarded if laryngismus is present. Is not this too serious a view to take? Here, at least, both laryngismus and facial irritability very commonly accompany rachitic convulsions, yet are hardly looked upon as very grave complications. Spasmus nutans is rather scantily noticed, and only the older views of its etiology are given. The chapter on speech defects is one of the very best in the whole book; it is impossible to find elsewhere as instructive and concise an account of the subject. It is followed by an almost equally admirable section on mental affections. We can confirm the observation that occasionally epicanthic folds are met with as an hereditary peculiarity in families of which one member suffers from mongolism. The authors have evidently forborne mentioning remedies of which they have had no personal experience. Thus epidural injections in enuresis, decapsulation in chronic nephritis, are passed over. The chapter on the urine is most interesting; the importance of hæmaturia as a symptom of scurvy is emphasised. Dr. Ashby evidently does not believe that a too exclusively farinaceous diet may cause gravel, as some have held, nor does he ascribe much importance to the gonococcus as a cause of vaginal discharges. In a future edition we should like to see a note on lymphatism added to the description of thymus enlargement, and the highly interesting subject of infantilism might receive more attention. The condition described by Gilford as ateleiosis is not, surely, the same as Brissaud and Lorraine's types of infantilism, yet such would seem to be the inference from this chapter.

Some apology is due for so many criticisms; it is because the book is so valuable as a whole that we venture to single out defects—many of them due to incomplete revision. It is easier to point to the few deficiencies than to the numerous excellences; among the sections which struck us as at the high-water mark of goodness, so to speak, we may enumerate those on coxa vara and rachitic deformities generally, those on joint diseases, on feverishness, on influenza, on anterior poliomyelitis, and on infant feeding. We hope that the book will pass through many future editions; it certainly deserves to do so.

The Diagnostics of Internal Medicine. By G. R. Butler, M.D. Second Edition. London: Sidney Appleton.

Although not entirely original, the plan of this work differs from that of most treatises on clinical diagnosis. It consists of two main divisions—the first dealing with symptoms and their indications, the second treating shortly of diseases and their differential diagnosis. The first of these comprises two-thirds of the book, and here the author shows himself a trustworthy guide along the well-worn track of physical diagnosis. We think that this division of the book will be found particularly useful by students, on account of the just proportion maintained throughout it between the older, tried friends of the case-taking card, and the newer, rather assertive, acquaintances from the clinical laboratory. Nearly half the book treats of the examination of patients by ordinary methods, and in reading these pages we found little to which exception could be taken. Still, one or two errors and omissions may be noted. Thus, under affections of joints, Still's disease, and the synovitis which so often follows injections of antitoxin, are not mentioned. Again, it is incorrect to state that congenital syphilis is a cause of enlargement of the fontanelle, while sporadic cretinism ought to have been included among the causes of delayed closure. The modification of the cardiac cycle on p. 328 is no improvement on that introduced years ago by Gairdner. Otherwise the chapter on the heart is good; Sansom's method of percussion, Flint's murmur, and various forms of sphygmanometer are described here. A sign often omitted from text-books—Litten's diaphragm phenomenon—is mentioned in the section on the lungs, and the proper way of demonstrating it is described. Coming to the nervous system, we failed to find any mention of the stereognostic sense, which ought to have been referred to; Quinquaud's sign of alcoholism, too, has escaped the writer's notice. The account of the nature of the knee-jerk is not in accord with modern ideas, and the method advised for testing the Achilles jerk is not a good one. The best way to elicit the sign is to set the patient kneeling on a stool with his feet hanging over the edge, and then to tap smartly on the tendon.

The account of the chemical examination of the urine, gastric contents, etc., is ample, though brief. Radioscopy, cryoscopy, and diagnostic puncture are also adequately described.

The last part of the book, as is inevitable from the compression required by the extent of the subject, is less satisfactory, and the necessary brevity explains many omissions. It is not in harmony with English experience that the desquamation in scarlet fever is "usually" complete in three or four weeks, and "but rarely" extends to seven or eight, yet curiously enough we have met with this statement in another well-known American text-book, as well as in Dr. Butler's volume. Another error which we noticed is the description of congenital hypertrophy of the pylorus as occurring in infants "of the average age of five months."

When, however, we consider the gigantic field which Dr. Butler's work covers, our wonder is not that mistakes have crept in, but that there are so few of them. The book is surprisingly accurate, and we heartily commend it. The illustrations are satisfactory, and exceptionally numerous.

A Text-book on the Practice of Gynæcology. By W. E. Ashton, M.D., LL.D. London and Philadelphia: W. B. Saunders & Co.

We are becoming accustomed to receiving text-books on every conceivable subject from America, which, however, while it must be confessed that they have for the most part an imposing appearance, vary very considerably in the quality of their contents.

Professor Ashton, in the present volume, gives us the benefit of his large practical experience.

If size and number of illustrations spelt success, this portentous tome would almost be unrivalled among the numerous large text-books of gynæcology which have recently been published.

A perusal of its pages in detail, however, by no means supports what might be expected from its physical proportions.

The author in the preface rightly states that it is not intended to reflect the opinion and work of others, but is merely a résumé of his own experience, and it is here wherein its weakness lies, if it is intended for a reference work on the subject. Doubtless his experience has been large, and the methods of treatment he recommends are good so far as they go, but it is questionable if the value of the work is enhanced by neglecting entirely the work of others. Individuality is, no doubt, strongly to be recommended, but a subject such as gynæcology is far too extensive for one to dogmatise from his own experience alone. For instance, the absolute ignorance of all plastic vaginal operations as a treatment for prolapse of the uterus seems a somewhat glaring omission; also the recommendation of complete hysterectomy for intractable cases of inversion, without considering the more conservative treatment by hysterotomy. Many of his assertions throughout the text are open to controversy. To state that rupture of the tube is the most common termination of ectopic gestation, is foreign to present-day teaching, death and separation of the ovum with resulting intra-peritoneal hæmorrhage through the abdominal ostium being far more commonly observed by experienced operators. One cannot agree with the sweeping statements in large print that menorrhagia or metrorrhagia are never caused by the menopause, although one may accept the recommendation that it is well in such cases always to examine for local mischief.

The chapters on hydrotherapy and dietetics seem superfluous. The diagrams, 1046 in number, are unnecessarily profuse, and in some parts simulate closely a general stores catalogue, as for example the illustrations of bottles of liquid soap and saline solution, nail-brushes, spirit-lamps, basins and jugs, while the diagrammatic representation of how the operator may adjust the nurse's overall trenches somewhat on the ridiculous.

The Pathology of the Eye. By J. Herbert Parsons, B.S., D.Sc. (Lond)., F.R.C.S. Vol. II. "Histology," Part 2. London: Hodder & Stoughton.

We gladly welcome Part 2 of this valuable treatise on the pathology of the eye. The volume begins with a chapter on the lens, in which are described the structure of the normal lens and the etiology and pathological characters of the various forms of cataract capsular and lenticular. No further light, however, has been shed on the vexed question of the etiology of cataract, the author's attitude, in certain instances at least, being, like the higher critics in theology, of a destructive rather than a constructive character. Most of the illustrations given in this chapter, as well as in many other parts of the book, are not original, being largely borrowed from the works of well-known authors, thus detracting from the freshness of the work.

The next chapter is devoted to the normal vitreous and its affections. It is difficult, by the way, to see how the canal of Cloquet can be regarded as a lymph space if it cease at about the middle of the vitreous.

The chapter on the choroid is exhaustive, and is specially well written, particularly that part dealing with degenerative changes. Sarcomatous conditions of the choroid are fully described and beautifully illustrated with microphotographic reproductions.

By far the most interesting and valuable part of the work, it seems to us, is that dealing with wounds and injuries of the retina, for it is the outcome of laborious investigations and is full of many original suggestions. The conclusions arrived at do not aim at finality, but whet the appetite for further research. To those familiar with recent histological technique, and who are in a position to procure the means and who can afford the time for such research, we heartily recommend this section as affording valuable suggestions for further research. In the brief space at our disposal we cannot enter into details or attempt to criticise the author's conclusions.

The part devoted to "retinitis pigmentosa" is exceedingly interesting, considering that only a few cases of this affection have been submitted to histological examination. But to the injuries and wounds of the optic nerve, an equally interesting subject, only a short space is devoted, namely, a page and a quarter, although hyaline bodies in the optic nerve receive some ten pages. This, together with other similar instances, makes the work unequal as a treatise, and detracts from its otherwise high quality.

The old term "papillitis" might with advantage be dispensed with, implying as it does that the optic disc is a papilla, whereas in reality it is a depression. "Choked disc" and "optic neuritis" are preferable to the terms "papillitis" and "true papillitis."

The histological changes met with in the optic nerve during inflammation are fully given, and we are pleased to see that the old ambiguous expressions "ascending" and "descending" degenerations are not viewed with favour, "proximal" and "distal" being preferred, these being used in the ordinary anatomical sense and not relative to the cells of origin. In accepting the modern theory as to the explanation of the atrophy found after so-called rupture of the optic nerve at the optic foramen, we have considerable doubt, for the appearance observed clinically is contrary to the general law of Wallerian degeneration. We must regard the nature of such atrophies as *sub judice*, the explanation offered by recent writers being irreconcilable to the now accepted views of the trophic centres of the nerve fibres of the optic nerve.

Tumours of the optic nerve—a subject interesting both to the pathologist and clinician—are carefully discussed, and at the end of the volume the pathological changes met with in the orbit and lachrymal apparatus are dealt with.

A curious typographical error has been allowed to creep in on two occasions. At pages 421 and 574 we find the word "evascular" instead of "avascular."

On the whole, this is an excellent book, and, like the previous volume, reflects the highest credit on the author. We have derived considerable pleasure and real profit from a careful perusal of the book, and we confidently recommend it to every ophthalmologist who wishes to keep abreast of this rapidly extending department of ophthalmic science.

Manuel Elementaire de Dermatologie Topographique-Regionale. Par R. Sabouraud, Chef du laboratoire de la Ville de Paris à l'hôpital Saint-Louis. Paris: Masson et Cie. 1905.

As might be expected from its author, the ideal plan of this work is original, and has been carefully and laboriously carried out. His notion is to divide the surface of the body into areas, and to study all the forms of skin disease which may be found thereon exemplified. But while some few disorders are more or less strictly limited to special regions where they commence or from which they take their start, far more are met with on many diverse portions of the body almost indifferently. The execution of the scheme therefore leads to much repetition and to the insertion of numerous cross references. Infinite care has evidently been taken with these to avoid error, and such as we have tested we have invariably proved to be correct. Though the volume extends to 750 large octavo pages, the observance of this mode of division of the subject-matter prevents any prolonged description of any one disease, but as it claims to be merely elementary, this is not perhaps aimed at. It seems to us that its principal defect is the absence of any ordinary table of contents and the total omission of an index. This renders it quite impossible to find any individual disease unless by referring to a locality. Thus, if we turn to the section "elbow," we find psoriasis particularised as one of the ailments localised there, and similarly under "leg" and "knee" it is again described. In the two first situations a method of treatment is sketched out, but in the third reference is made to the end of the volume to which general cutaneous diseases of uncertain localisation are relegated. These are grouped together under various heads, such as papular, vesicular, exanthematic, etc., following the classification of Willan in great measure. Had there been a general index, our way would have been easy, but as it is one must perforce grope one's way, and ferret out the disorder one is in search of as best one can.

Coming to the text itself, it goes without saying that the account provided of each disease is terse and clear. Sabouraud seems, however, to have abandoned some of his etiological views so specifically set forth in previous elaborate writings. He now regards alopecia areata and eczema as ailments of unknown origin, with the reservation that here he appears more as the clinician than as the laboratory worker, and all his statements from that point of view are precise and definite. In treatment one is somewhat surprised how much he relies on tar, used too occasionally in strengths which could hardly be well borne by British skins. The welcome *entente cordiale* has possibly scarcely had time to bear fruit in careful study of the recent work done in this country, the incorporation of which with that accomplished by our genial neighbours would undoubtedly have fortified the volume. This will come as we grow to know one another better, and since we see it announced that the book will soon be available in an English translation, it will then be greeted by a large circle of readers as a valuable addition to our existing treatises. It only remains to notice the illustrations in black and white, which are not only numerous but of more than ordinary excellence.

Atlas and Epitome of General Pathologic Histology. By Dr. HERMANN DÜRCK. Authorised Translation by LUDVIG HEKTOEN, M.D. With 80 Plates. Philadelphia, New York, and London: W. B. Saunders & Co.

THIS is one of the best illustrated text-books of general pathology hitherto published. Dürck's "Atlas of Pathology" is well known. It comprises 3 vols., two of which are devoted to special pathology, and the third, of which this is a truthful and readable translation, deals with the subjects of general pathology, namely, circulatory disturbances, atrophy, retrogressive metamorphoses, reparative processes, and tumours. The first division, that of the circulatory disturbances, is shorter than the others, but it deals with hæmorrhage, thrombosis, embolism, and infarcts in a clear and simple manner. The subject of infarcts lacks fulness in comparison with some of the others, and the student will require to extend his knowledge of some of its aspects from other sources. The subject of abnormal pigmentation has much to commend it. Its account of the pigments derived from the hæmoglobin is good. Without being drawn out unduly, it yet manages to give their salient points, aided by some useful additions by the editor. Hæmochromatosis, hæmofuscin, ochromosis, and chloroma are all considered. On the other hand, the bile pigments and jaundice are rather scantily discussed. Autochthonous pigmentation is well described, while necrosis might with advantage have been amplified. In the healing of wounds due notice has been taken of recent work upon certain classes of cells, *e.g.*, Marchand's leucocytoid cells and Maximow's polyblasts are explained and brought into line. It is explained also that skin grafts only favour healing by forming a protective layer under which the marginal epithelium grows in, but the grafts themselves do not form centres of growth. Ehrlich's classification of leucocytes is adopted in the description of granulation tissue, and no reference is made to recent views of the possible identity of all forms of mononucleated leucocytes. The only specific inflammations described are the chronic ones, the infective granulomata, tubercle, syphilis, etc. Fully 150 of the 360 pages of the book are devoted to a description of the various tumours, of which a very good account is given. Even special and rare tumours, such as chorion epithelioma, are included, and the student will find this part of the book very useful and complete. The author has confined himself throughout the whole book to facts and generally accepted views, rather than to mere theories, and has provided the student with a helpful and valuable guide to the study of pathologic histology.

A Text-Book of Psychiatry. By LEONARDO BIANCHI, Professor of Clinical Psychiatry in the University of Naples. Translated from the Italian by JAMES H. MACDONALD, M.B., Assistant Physician, Govan District Asylum, Paisley. London: Baillière, Tindall, & Cox.

THIS is a volume of somewhat formidable size, but the apparent prolixity is redeemed by the good type and the liberal space allowed by the publishers. It is just a question whether the usefulness of text-books on insanity is not a thing of the past, excepting, of course, elementary manuals for students. The subject has been so specialised that no single treatise can possibly deal satisfactorily with its various subdivisions. Professor Bianchi's reputation in Europe will, however, mitigate any prejudice of this kind, and his work will be read by the English-speaking alienists with the respect due to his name. Here it may be stated that the work of translation has been admirably done. The sense is nowhere doubtful. Dr. Macdonald, though a comparatively young member of the speciality, has shown a masterly grasp of the subject in the interpretation of highly complex and abstruse ideas, which many people find difficult enough to understand when presented to them in their own language. To resume criticism of the author, it may be pointed out that the book is divided into three parts. The first two parts deal with the anatomy and physiology of the cerebrum, and with the morbid psychology of mind, respectively. These two sections extend to about 400 pages of the text. The third part, which occupies about 500 pages, is chiefly clinical. The first two parts are so masterly and illuminating that we must again express regret that they do not form a separate monograph, although to those who are prepared to read them for instruction they ought to be gratefully acceptable in any form. The third and largest part, devoted to the clinical elucidation of the subject, is undoubtedly less satisfactory from the general point of view. That it abounds in useful and new facts is true, but that the presentation of the subject is too individualistic and too aloof from current and traditional acceptations, is a fault which not even the genius of the author can redeem. Unless on the basis of a fundamental scientific discovery, it is impossible for any man, however distinguished, to break with the accumulated results of the labours of his predecessors, and there are many indications throughout the book of a tendency to do this. For instance, he introduces a new designation, "sensory insanity," which is intended to include all those forms, such as katatonia, hebephrenia, etc., which Krapaelin classes under dementia præcox. In common with many others, he brushes aside dementia præcox as unscientific; with that no person can quarrel; but when he gravely tells us that they are all due to acute "sensory" disturbance, and are better described as sensory insanity, he is merely adding to the confusion which he believes already exists. It might pertinently be asked, What causes the sensory hallucinations after which he names this new insanity? On the whole, while it must be acknowledged that the descriptions of the various diseases, the etiology, and the illustrations are excellent, the portions devoted to treatment present no advance on the works of other European authors. There are remarkably few mistakes. One, which is either a mistranslation or a printer's error, occurs at page 523, where, under the etiology of epilepsy, "carbonic" acid ought to read "carbamic" acid.

If not epoch-making, the book is, at any rate, a monumental one, without which the library of a specialist on the subject will not be complete.

Ellis' Demonstrations of Anatomy. Twelfth Edition. Revised and Edited by CHRISTOPHER ADDISON, M.D., F.R.C.S. London: Smith, Elder, & Co.

THE issue of this new edition of Ellis' "Demonstrations of Anatomy" marks a great change in the general character of the work, for the recent advances in anatomy have involved very considerable alterations in the text, and the higher standard of modern anatomical illustrations has necessitated many changes in the former diagrams. The matter has been re-arranged, and now follows the order of dissection as carried out in the Edinburgh, and in practically all other medical schools.

We may say at once that these changes have completely altered the status of the work, and now give it a place among the best manuals for students.

The text of the volume is satisfactory, and has been brought into accordance with the most recent anatomical descriptive work, while still retaining the completeness as well as general character and features of former editions. The illustrations of the dissections have been greatly improved by the addition of colour to many of them, and many additional illustrations have been inserted.

Those dealing with the abdominal cavity and viscera are perhaps the best of them, and include reproductions of several from Dr. Addison's own work upon the topography of the viscera, which are excellent. The figures illustrating the thoracic cavity are not nearly so good, and Fig. 170 is even a misleading representation of the arch of the aorta.

The figures of the bones, with the muscular attachments indicated in colour, constitute an improvement, but most of them are on too small a scale, and the coloured areas give only a general indication of the areas of attachment.

The preparation of an edition containing so many changes must have involved a great amount of work on the part of the editor, and we can congratulate him upon the degree of success which he has attained in bringing the work up to the standard of modern requirements in a book of the kind.

Clinical Diagnosis: The Bacteriological, Chemical, and Microscopical Evidences of Disease. By RUDOLF V. JAKSCH, M.D. Fifth English Edition. Edited by ARCHIBALD E. GARROD, M.A., M.D., F.R.C.P. London: Charles Griffin & Co.

OWING to the lamented death of Dr. Cagney; who, by his able translation of von Jaksch's now widely known work, earned the gratitude of English-speaking medical readers, the responsibility for the editing of the English version of the fifth edition has devolved upon Dr. A. E. Garrod. The new editor has not treated his office as a sinecure, but has annotated the German text, and has substantially added to it out of his own large experience in clinical and pathological chemistry. At the present day it is scarcely necessary to speak in detail of the many excellences of this volume. It is a storehouse of clinical and literary research on bedside methods of chemical and pathological diagnosis. In its own way it has no equal, and it has the further merit of having given a great impetus to the study of the subjects of which it treats, while as a book of reference it is indispensable to the hospital physician. As in previous editions, the illustrations are numerous, and their number has been slightly increased. Beginning with the blood, the author considers fully its normal and pathological anatomy, the methods of observing and staining corpuscles and parasites, agglutination, changes due to poisons, and several other matters. The sputum, the gastric juice, vomit, fæces, intestinal microbes and parasites, exudates, transudates, and the secretions and excretions generally are all very fully dealt with. The account of the urine is especially full, and deals with many rare conditions.

It is impossible in a short space to offer any detailed criticism of such an elaborate collection of facts and observations as is contained in the volume before us, but a few general remarks may be of interest to the author and editor in view of the next edition. The present volume is considerably bulkier than its predecessors, and on looking through it one is forced to the conclusion that this is a disadvantage, and, moreover, a disadvantage which might be easily remedied. It is generally admitted that the German scientific style tends to be ponderous and verbose, it is often redundant, and contains too many reservations. In an English translation there is certainly no necessity to imitate these faults by a too slavish adherence to the original text. It seems unnecessary also to tell us that "the urine is the secretion of the kidneys," or to describe ptomaine poisoning by such an uncouth term as "exogenic toxicosis," or to describe the effect on the urine of such forgotten and unused drugs as kairin and thallin. In short, considerable pruning and the omission of many descriptions, such as that of Lustgarten's bacillus of syphilis, would increase the practical value of the book. A section is devoted to a very elementary description of the microscope, and there is even a plate (occupying a whole page) of a very ordinary instrument, while a sandbath and a centrifuge, or "sedimentator" as it is called, are also figured. Many other small matters might be mentioned, but the whole can be summed up in the opinion that considerable condensation and pruning would greatly improve the next edition.

NOTES ON BOOKS.

In the preparation of the *Report on the Surgical Cases noted in the South African War* 1899–1902, Surgeon-General W. F. Stevenson has had the able co-operation of Lieut.-Col. Sylvester, Major Mallins, Brevet Lieut.-Col. Hickson, and Major Holt. The difficulties inherent to the compiling of such a work are readily appreciated even by the layman, and the editor frankly admits that the material placed at his disposal was comparatively limited in amount and not always as accurate and complete as might be desired. We fully recognise that in the exigencies of active warfare there is little time for note-taking, particularly under the conditions in which the surgical staff were placed in South Africa. Despite these limitations, however, the Report before us bears witness to the fact that much sound surgical work was done by those surgeons, both military and civil, who accompanied our troops during the late war. Surgeon-General Stevenson and his co-workers have made the most of their material, and the result is a work which all who desire to know the effects of modern projectiles and the conditions of surgical work in warfare must consult. We have studied the various sections carefully, and, where all are so good, we hesitate to select any for special mention. We may be allowed to say, however, that the compliment paid Dr. A. Young, late Civil Surgeon, South African Field Force, of adding his valuable contribution on "Gunshot Injuries of Peripheral Nerves" as an Appendix to the Report, is well deserved.

We have received from the New Sydenham Society, fasciculus xii. (New Series) of the *Atlas of Illustrations of Clinical Medicine, Surgery, and Pathology.* The present instalment of this excellent publication includes a series of sixteen illustrations of miscellaneous subjects, and twenty radiographs of injuries of bones and joints. The former group includes some beautiful plates illustrative of Sprengel's shoulder, winged scapula, English cretinism, albinism, Bazin's malady, accessory thyroids, tuberous leprosy, and syphilis in various phases. A short, eminently clear and instructive commentary accompanies each plate. The radiographs, which are mostly from the Jones-Morgan collection, are beautifully clear, and are much more instructive than the majority of such reproductions are. The medical profession is laid under a deep debt of gratitude to Mr. Jonathan Hutchinson for the labour he expends on the selection and publication of these valuable illustrations, and we can confidently commend the Atlas to the attention of all who desire to keep abreast of modern work in clinical medicine and surgery.

The preparation of the sixth edition of Rose and Carless' *Manual of Surgery* (Baillière, Tindall, & Cox, London) has been undertaken by Mr. Carless, who has enlisted the co-operation of several of his colleagues at King's College Hospital in the revision of certain chapters. The whole work has been revised, several chapters have been rearranged, and the book has been rendered more convenient for handling by certain modifications in its make-up. These changes can only enhance the popularity of this excellent text-book.

We have to record the appearance of a fifth edition of Dr. Chas. L. Scudder's work on *The Treatment of Fractures* (W. B. Saunders & Co., Philadelphia, 1905). It has been revised, and some new illustrations have been added. In the preface, the author remarks that "the treatment of fractures of the neck of the femur is gradually undergoing a change which may prove to be a very radical one." This may be true, but we find no evidence of it in the text.

Dr. A. N. M'Gregor has issued a useful *System of Surgical Nursing* (David Bryce & Son, Glasgow). He has succeeded admirably in the difficult task of keeping his exposition within the bounds of what the nurse should know. We cannot profess to follow the system he has adopted in arranging his material, how, for example, the only description of gangrene comes to be in relation to one form of ulceration; or how abscess and fistula are described in the chapter on inflammation. A certain want of detail throughout the body of the book is corrected by an excellent appendix, in which accurate instructions are given for the sterilisation of the hands, the disinfecting of the theatre, the preparation of catgut, and other important matters, not excluding the nurse's foot-wear and the arrangement of her hair. The work is not illustrated.

In this book—*Electrical Methods in the Treatment of Affections of the Stomach and Intestines*, by George Herschell, M.D. (London: A. Seigle)—are reprinted, with alterations and some additions, a series of papers which have recently appeared in the *Journal of Medical Electrology and Radiology*. The instructions given are clear and simple; the author has very definite and not unduly optimistic views as to the scope of electro-therapeutics in gastro-intestinal disorders, and we are certain that any practitioner who feels desirous of this means of treating a very troublesome class of cases will be well repaid by studying Dr. Herschell's book.

Indigestion, by George Herschell, M.D., Third Edition (London: Henry J. Glaisher), will be a useful and practical guide to the treatment of the various functional disorders of the stomach. The author is at his best in the chapter on intragastric methods of diagnosis, which he applies with a clear and definite end in view, and not in a haphazard manner, or in the attempt to attain impracticable refinement of diagnosis. The appendix on cookery is excellent, and contains recipes which make one envy Dr. Herschell's dyspeptics. The author has the knack of emphasising his points by a forcible and entertaining manner of writing—journalese, even to the split infinitive, but none the less readable on that account. Here is a new "problem of conduct" from his pages: When the lady whom you have taken down to dinner asks a question just as you have begun to masticate, what is the correct course? Bolt, answer with your mouth full, or let her wait? Mr. Gargery's advice to Pip: "Manners is manners, but still your 'elth's your 'elth," ought to have supplied Dr. Herschell with the answer, but he enjoins politeness—and condemns conversation at the dinner table.

This little volume—*Drink Restriction* (*Thirst Cures*), *particularly in Obesity*, by Carl von Noorden (Bristol: John Wright & Co.)—is the sixth of the valuable series of translations of Carl von Noorden's monographs on diseases of metabolism and nutrition, which is now being issued under the general supervision of Dr. Boardman Reid. Small though its size be, in its eighty pages the book contains pabulum of a highly concentrated nature, and he grievously errs who thinks to digest and assimilate its contents after skimming it in a spare hour. It is a work which repays, and requires, close reading, and its study should give pause to those who lightly recommend thirst cures without realising how profoundly these may affect the animal economy. Speaking broadly, Noorden shows that water restriction accelerates neither oxidation nor the destruction of fat; if it is carried very far, the metabolism of albumin is increased. The principal results of therapeutic importance which it produces are the sparing of the circulatory and digestive apparatus, the dehydration of the body, and the diminution of appetite. In the application of these principles to the ends of the treatment, the book is a trustworthy and authoritative guide.

International Clinics. Vol. II. Fifteenth Series. Edited by A. O. J. Kelly, M.D. (Philadelphia and London: J. B. Lippincott Co.).—The twenty-three papers in this volume of International Clinics cover a wide range of subjects, comprising therapeutics, medicine, surgery, gynæcology, ophthalmology, rhinology, physiology, and pathology. Thus all tastes are catered for, and yet the writers in general deal with topics interesting to the practitioner as well as the specialist. Of the articles on treatment, Dr. Morse's paper on the management of nephritis in childhood is one of the best; it is a clear exposition of the principles of dietetics, as governed not merely by the disease, but by the physiological needs of the child. Like much other work in this direction, it shows the influence of Noorden's teaching. Sabouraud tells how by X-rays he can cure ringworm in three months, and gives particulars of a new method of measuring the rays. The papers on medicine are scarcely up to the usual level of merit; Dr. Benedict's article on sea-sickness, though short, is the most suggestive and interesting. An article on the hernias of children, by Dr. Corner, has the place of honour in the surgical section. The most valuable paper in the volume, however, is Wiesel's contribution to the physiology and pathology of the chromaffin system—the recently discovered adjunct to the sympathetic nerves and ganglia—in which it seems as though the mystery of Addison's disease is at last to be unravelled. If we mistake not, this is the first account of Wiesel's work which has appeared in English, and Dr. Kelly has been fortunate in securing it for the International Clinics, which he so ably edits.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

J. S. FOWLER, M.D., F.R.C.P.Ed.,

EXTRA PHYSICIAN, ROYAL HOSPITAL FOR SICK CHILDREN.

Diseases of the Digestive Organs.

A fair amount of work has recently been published on methods for testing the functional activity of the stomach and other digestive organs. In two papers Hewes (*Boston Med. and S. Journ.*, 1905, June 15 and October 12 and 19) discusses the accuracy of modern clinical methods in the diagnosis of *diseases of the stomach*. The recognition of gastrectasis, or insufficient drainage of the stomach, indicating, as it does, an actual mechanical abnormality (usually due either to ulcer or cancer) is the first point investigated. The test for stasis adopted by Hewes was the retention of the Leube test-meal for twelve hours or more, the stomach contents withdrawn at the end of that time being examined with reference to—(1) Quantity and appearance, (2) presence of macroscopic food residue, (3) microscopic character of the sediment, (4) free HCl, (5) lactic acid, and (6) fermentation *in vitro*. In this way 180 patients, of whom twenty were healthy, were examined. The pathognomonic characteristics of stasis were found to be—(1) The presence of abnormal food residue, (2) sarcinæ, (3) lactic acid, and (4) abnormal yeast fermentation. The first of these was the most frequent, being found in twenty-four out of twenty-six cases; while sarcinæ were present in only seven, lactic acid in eight, and abnormal yeast fermentation in eighteen. The normal flora of the fasting stomach are bacteria and a few yeast cells, which are numerous in proportion to the hypo-acidity or absence of free HCl. Sarcinæ occur exclusively in stasis, usually when free HCl is present. Lactic acid is not found unless free HCl is absent; it is of diagnostic value only when got from the fasting stomach. The test for abnormal yeast fermentation is carried out by mixing 20 c.c. of the gastric contents with half its volume of 10 per cent. glucose solution, and measuring the gas given off in twenty-four to forty-eight hours. If little or no gas is evolved, the test is negative; but if one cubic centimetre or more is developed, then the sediment in the fermentation tube is examined microscopically, and should colonies of freshly budding yeast spores be detected, the test is positive. In cases other than stasis there may be a considerable formation of gas from bacterial fermentation, in which case no yeast fungi are present. Bacterial fermentation takes place only in the absence, yeast fermentation in the presence, of free HCl. An advantage of this test is that it can be applied to any vomited stomach contents, not merely to that withdrawn by the tube. Of these four characteristic signs of stasis, none occurs in any other condition, hence any one of them is diagnostic; the first, which is the most constant, should, of course, be investigated before the others. In all of twenty-one cases in which stasis was recognised by this method, and in which the diagnosis was subsequently verified by operation or autopsy, pyloric obstruction was present. Hewes concludes that—(1) Pyloric obstruction can always be recognised by proper methods; (2) constant twelve-hour stasis is a sign of a serious lesion, and (3) is not an accompaniment of either ulcer or cancer unless these affect the pylorus.

Turning to the *diagnosis of gastric ulcer and cancer*, he states that the objective findings of particular value are—(1) Chronic stasis, (2) hæmorrhage, (3) the presence or absence of free HCl and lactic acid, (4) the detection of pus, organisms, or cancer tissue, and (5) the size and position of the stomach. The first of these has already been referred to. Hæmorrhage, while it occurs in several acute diseases, is a symptom of only three chronic ones—cancer, ulcer, and stenosing gastritis, the last of which is usually secondary to one of the other two. Fresh blood is readily detected; "occult" bleeding is recognised by adding one-third of glacial acetic acid to the gastric contents, extracting with ether, and testing with guaiacum. Excluding cases in which hæmorrhage was caused by the passage of the tube, Hewes found blood in twenty-two out of 180 examinations—all either cancer or ulcer. Occult blood in the fæces is tested for in the same way; it occurs under a variety of conditions, and is chiefly of value as a negative test, absence of blood being strongly against both ulcer and cancer.

The acids of the gastric contents are of less diagnostic importance. Absence of free HCl one hour after Ewald's test breakfast is the rule in cancer, but exceptions are numerous. In Hewes' 160 cases, free HCl was absent in nineteen, of which fifteen were carcinoma; in five cases of cancer free HCl was present. If stasis or hæmorrhage be present, absence of free HCl suggests cancer; its presence does not exclude the disease. Lactic acid occurs in the fasting stomach only in the absence of HCl; it is therefore rare in ulcer, common in cancer. In the diagnosis of cancer, the discovery of "cancer cells" is of very little weight. Organisms are chiefly of importance as indicating stasis; this applies to the Boas-Oppler bacillus, as well as to other bacteria. The examination of the size of the stomach is chiefly of value when taken in conjunction with stasis: if the size and position of the organ are approximately normal, then stasis is due to organic obstruction; while, if the viscus is much dilated or ptosed, atony or position may be the cause of the gastric insufficiency. Hewes believes, however, that stasis is generally organic.

A test of gastric activity not involving the use of the stomach tube would do more than almost anything else to popularise the scientific study of gastric disorders, and for this reason *Sahli's desmoid reaction* is a step in the proper direction. The new method is described by its discoverer in the *Cor.-Bl. f. Schweiz. Aerzte*, Basel, 1905, April 15 and May 1. The test consists in the introduction into the stomach immediately after an ordinary meal of a rubber capsule containing iodoform and methylene-blue; the mouth of the capsule is tied up with unprepared catgut (which is digestible only in the stomach, not in the intestine). During digestion the catgut is dissolved, the capsule opens, and its contents appear in the urine. Sahli gives one of these capsules after the midday meal, and collects the urine passed at six o'clock, as well as on the following morning. If it gives the reactions of iodine or methylene-blue, the test is positive; if not, negative. More exact data as to the time of absorption may be got by frequently testing the saliva for iodine, but, practically, a positive or negative test in the above sense is the chief matter to be attended to. Normally, the test is positive on the evening of the day on which the capsule is swallowed. By observations on patients with gastric disease, Sahli finds that a positive desmoid reaction is not always associated with the presence of free HCl after a test breakfast, and also that a negative reaction may be met with notwithstanding abundant free HCl. The former of these apparent contradictions is due to the fact that Ewald's test breakfast is an arbitrarily selected meal, which may be inadequate to evoke the secretion of HCl in a stomach habituated to richer fare. The second is more difficult to explain; possibly a stomach which can secrete HCl freely after a test breakfast may yet be incapable of doing so in the presence of a full meal; possibly the pepsin is deficient, or it may be that the stomach is unduly motile, and rapidly drives the unopened capsule through the pylorus. For practical diagnosis the desmoid reaction is particularly valuable in the group of cases in which no free HCl is found after a test breakfast; it distinguishes the mild cases from the serious ones due to cancer and pernicious anæmia, the reaction being positive in the former, negative in the latter. The test will probably find its chief place in the recognition of carcinoma, since when it is negative it implies diminution in free HCl, total acidity, or peptic activity. Sahli lays particular stress on the fact that the desmoid reaction is a test of the digestive capacity under *normal conditions* as to food, and that when it is positive it proves that the ordinary meal which has been taken is properly digested.

Eichler (*Berl. klin. Wchnschr.*, 1905, November 27) reports observations on the desmoid reaction on thirty patients; he entirely corroborates Sahli's results. Kuhn (*München. med. Wchnschr.*, 1905, December 12), after an experience of fifty-four cases, extols the test as of great value, while in practice the fact that it is not necessary to pass the stomach tube is a great advantage.

Erythema Infectiosum.

The first account in the English language of this new member of the exanthemata (referred to in last January's Abstracts in Medicine) is an article by Shaw in the *Am. Journ. Med. Sc.* for January 1905. His description is as follows:—It is feebly contagious, with slight subjective symptoms, and a maculo-papular rash, chiefly on the cheeks, legs, and outer aspects of the arms. The age most susceptible is from the fourth to the twelfth year. The incubation is from six to fourteen days. A diagnostic feature is the aspect of the rash on the face, where it is first to appear, and resembles erysipelas in being red and hot, of a swollen turgescent character, with well-defined margin. On the second day the measly rash spreads over the rest of the body, much more abundantly, however, on the limbs than on the trunk. It lasts for from six to ten days; there is no desquamation or glandular enlargement. The malady is benign, and complications are unknown Shaw discusses the differential diagnosis fully, and the value of his paper is enhanced by the fact that it contains coloured plates giving a good representation of the eruption.

SURGERY.

UNDER THE CHARGE OF

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THE INDICATIONS AND RESULTS OF NEPHRECTOMY, ESPECIALLY IN RENAL TUBERCULOSIS.

A DISCUSSION on the above subject, at the annual meeting of the German Surgical Society, was opened by Rovsing of Copenhagen (*Centralbl. f. Chir.*, Leipzig, 1905, No. 30) with an interesting paper based on the results in 112 cases of nephrectomy. Before discussing present methods of ascertaining the presence and functional activity of the "other kidney," he discusses three questions—(1) How extensive must the tuberculous lesion of the kidney be to indicate removal of the organ? (2) To what extent does extension of the disease to the bladder contra-indicate nephrectomy? (3) To what extent does complication with genital tuberculosis contra-indicate nephrectomy when one kidney only is diseased?

In answer to the first question, he maintains that every, even apparently localised, renal tuberculosis indicates excision, because spontaneous recovery is extremely rare, if, indeed, it ever occurs; while expectant treatment exposes the patient to the risk of dissemination of the disease, and is an unjustifiable waste of time. Resection of the diseased portion alone is not to be advised, for experience has shown that it is not possible to estimate accurately the extent of disease in a kidney on the operating table. In answering the second question, Rovsing states that limited disease of the bladder often heals spontaneously after removal of a diseased kidney, and he is able to point to five cases of his own in which this has happened. In cases of extensive ulceration of the bladder, spontaneous recovery is not to be looked for, and Rovsing, in common with others, has used various injections, cauterisation, X-ray treatment, etc., in vain. Recently, however, he has found that even advanced cases yield to repeated washing with 1 in 20 carbolic lotion. His method is to inject 100 c.c. of 1 in 20 carbolic warmed to 38° C., and allow it to remain in the bladder for five minutes, when it is removed and a second and third injection made. This is repeated every second day till the urine becomes clear, and the bladder, on cystoscopic examination, is seen to be healed. Of eleven cases so treated, ten recovered, and the eleventh is well on the way to recovery. In view of these results, Rovsing holds that advanced ulceration of the bladder is no contra-indication to nephrectomy.

In answer to the third question, Rovsing again points to his results. Ten of his cases of nephrectomy suffered also from genital tuberculosis—four from bilateral, six from unilateral disease. Nine of these patients recovered after castration or resection of the epididymis, generally done at the same time as the nephrectomy. Rovsing, therefore, protests against genital tuberculosis being regarded as a contra-indication to operative treatment of a diseased kidney.

Passing to the all-important question as to how the existence of the "other kidney" as a functionally active organ can be determined, Rovsing examines the various methods that have been introduced to solve this problem. He condemns the results given by the injection of methylene-blue and indigo-carmine, the injection of phloridzin, and the indications given by cryoscopy, as unreliable. The injection of colouring materials he regards as unreliable, because it has been shown that markedly degenerated kidneys may allow the pigment to pass freely. The phloridzin test is also unreliable, for he has had nine cases where a healthy kidney has failed to excrete sugar after injection of phloridzin. In all these cases the diseased kidney was removed, and eight of the patients recovered perfectly. One died of sepsis and uncontrollable bleeding, and at the autopsy the remaining kidney was found healthy. In fifty cases where cryoscopy was used, a totally misleading result was obtained in twelve, for in six cases, where the freezing-point of the blood was 0·6° C. or more below that of distilled water, nephrectomy was done, and all the patients recovered, while in six other cases a normal freezing-point of the blood was found in spite of advanced disease in both kidneys.

Rovsing's general conclusions may be stated as follows:—None of the modern methods for functional kidney diagnosis are reliable, and for this reason, that temporary interference with the function of a kidney does not mean that the organ itself is diseased. Many things may interfere with the functional activity of a kidney, and particularly disease of the other kidney. Consequently, when the diseased organ is removed, the remaining kidney may, and, as a matter of fact, does, resume its normal functional activity. The indications given by cryoscopy are absolutely worthless in judging whether a kidney may be safely removed or not. Of other methods the most reliable is the chemical, microscopical, and bacteriological examination of the urine obtained from each kidney by catheterisation of the ureters. When urine from one kidney contains neither albumin, blood, nor micro-organisms, the other kidney may be safely removed. When albumin is present in one urine without pus or organisms, it is probably a toxic albuminuria, which indicates prompt removal of the other kidney from which pus, etc., are coming. When ureteral catheterisation is impossible, Rovsing invariably exposes both kidneys by lumbar incision before removing one. A table of statistics is appended to the paper, which shows that Rovsing's results have improved even more than the results of those who rely on the various methods of functional kidney diagnosis in their selection of cases suitable for nephrectomy.

Israel (Berlin), in continuing the discussion, stated, as regards cryoscopy of the blood, that his own experience, as well as that of others, had shown that a normal freezing-point might be found in advanced disease of both kidneys, and also in cases where disease affected a solitary kidney, *i.e.* where the patient only had one kidney; while, on the other hand, an abnormally low freezing-point had been found in cases of unilateral kidney disease where nephrectomy might safely be carried out. Israel has found the phloridzin test also unreliable, because a healthy kidney often fails to excrete sugar. He compares the results of those who rely on methods of diagnosing the function of the kidneys with the results of those who make no use of them, and finds that the latter have really slightly better results than the former. He attributes the improvement in the recent results of all operators to the fact that cases are operated on in the early stages nowadays, and not, as formerly, when disease is advanced. In Israel's opinion the various methods for functional diagnosis have in no way contributed to recent improvement in results.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Laryngeal Tuberculosis an Indication for the Induction of Premature Labour.

Kuttner (*Berl. klin. Wchnschr.*, 1905, July) has collected eighty-three cases of pregnancy with laryngeal tuberculosis, and considers sixty-six. Of the sixty-six children, 60 per cent. died soon after birth, ten lived more than a year; four were delicate, eleven died during the first week. Pregnancy is rare where laryngeal tuberculosis is already present, the patients generally become affected in the early months, and rapidly lose ground. The author concludes—(1) In marked laryngeal tuberculosis, pregnancy makes the prognosis much worse; (2) the outlook for the child in these cases is bad; (3) if there is any probability of saving the mother, pregnancy should be terminated in the early months; (4) in the later months of pregnancy tracheotomy gives better results for the child.

HÆMATOMA OF THE VULVA AND VAGINA.

WALTHER (*Centralbl. f. Gynäk.*, Leipzig, 1905, No. 29) reports two cases, and distinguishes those occurring in labour and in childbed. In the former, if the swelling be small, expectant treatment may be employed; but if it enlarges, then incision and plugging must be at once resorted to, and before gangrene or suppuration occurs. In cases where the swelling forms above the fascia, the tumour is often not recognised, on account of its not forming a perceptible swelling at the vulva. The management of those cases is the same. If the hæmatoma form during the puerperium, expectant treatment is to be adopted, operative treatment being carried out with great caution, and only when there are definite indications.

MYOMATA AND THE MENOPAUSE.

WINTER (*Berl. klin. Wchnschr.*, 1905, July) believes that myomata do not necessarily atrophy at this time, but, on the contrary, they frequently cause the menopause to be delayed for some years, and may also undergo malignant change. He tabulates out of 718 cases, sixty-one myomata after the menopause had been established for at least one year. Of these, twenty-five had the menopause between 46 and 50; twenty-two between 50 and 55. Of these sixty-one, four were operated on for cancerous degeneration, nine polypoid degeneration, four sarcomatous change, two torsion of the myoma, six severe hæmorrhage, eight rapid increase in the size of the tumour. Winter therefore concludes that myomatous tumours frequently require to be removed, on account of rapid increase in size and degenerative changes, even at the period of the menopause.

LARGE HEAD AN INDICATION FOR OPERATIVE DELIVERY.

SELLHEIM (*Centralbl. f. Gynäk.*, Leipzig, 1905, No. 35) reports the following case:—P., 8-para, æt. 38, had seven non-instrumental deliveries, although the pelvis was flat, with a diagonal conjugate of 10·5 cms. At her eighth confinement, Sellheim sent the patient into hospital with a view to pubiotomy, as he regarded the delay in labour to be caused by very large size of the child's head. Before this operation was undertaken the uterus ruptured, and the case was treated successfully for the mother by abdominal hysterectomy. It is interesting to note that the first seven children were those to a first husband who took size 54 in hats, the eighth child was to a second husband, whose head had a circumference of 60 cms.

CÆSAREAN SECTION IN THE VIENNA KLINIK.

NEUMANN (*Centralbl. f. Gynäk.*, Leipzig, 1905, No. 29) reports that in the last twenty years Cæsarean section has been performed 175 times in Schauta's klinik, of whom 161 recovered, fourteen died, but only eight of the fatal cases could be attributed to the operation. Of the children, 165 were born alive, nine were still-born, and one died half an hour after delivery. The chief indication for the operation was pelvic contraction. Of 158 cases, the contraction was absolute in forty-seven, relative in 111; in six cases there was stenosis of the soft parts, three cases of tumour obstruction, one malignant case, five cases of eclampsia, two septic endometritis. In 141 operations the patients were not sterilised, fifteen Porro's operation, one total hysterectomy, eighteen sterilisations with the uterus left intact. To avoid mortality, there must be absolute asepsis, and no previous examinations by persons with septic hands. The importance of this is shown by the higher mortality after cases of moderate pelvic contraction, where several examinations have been made in the attempts to deliver, previous to the cases being sent into hospital.

TREATMENT OF SYPHILIS DURING PREGNANCY.

GAUCHER (*Journ. de méd. de Paris*, 1905, September) points out that the best results are obtained if the treatment be begun early in pregnancy, when the infection occurs previous to this, or as soon as it takes place in infections during pregnancy. The best form of mercury is the sublimate in pill form, or benzoate of mercury for subcutaneous injection. Two cgrms. are given daily by injection, alternating with pill administration. Iodide of potassium is seldom required.

ASPIRIN IN GYNÆCOLOGY.

MERKEL (*Deutsches Arch. f. klin. Med.*, Leipzig, 1905, No. 19) states that aspirin in 2 grm. doses in twenty-four hours is of greater service than other salicylic preparations. He recommends it in cases of inoperable uterine cancer, neuralgia from pressure of pelvic tumours, dysmenorrhœa, especially if associated with anæmia, and after pains.

BIERS' TREATMENT IN GYNÆCOLOGY.

RUDOLPH (*Centralbl. f. Gynäk.*, Leipzig, 1905, No. 39) points out that there are three methods of bringing about artificial congestion—(1) Ligature, (2) effect of heat, (3) suction. The last is most effective and more local in action. He describes a very simple apparatus like a test tube, with a tube attached at the side for suction. The indications for its use are chronic inflammatory processes generally treated by hot douches.

TORSION OF THE PEDICLE OF A MYOMA.

STEINBUCCHEL (*Wien. klin. Wchnschr.*, 1905, No. 37) reports the following case:—P., æt. 44, nullipara, was seized with severe peritoneal symptoms and collapse, the latter pointing to a severe internal hæmorrhage. Laparotomy revealed multiple myomata, one showing torsion of its pedicle. A large vein had been ruptured as the consequence of the twist. Patient recovered.

The Management of Inoperable Uterine Carcinoma.

Chrobak (*Wien. klin. Wchnschr.*, 1905, No. 38) recommends in such cases the careful use of the curette, followed by fuming nitric acid as a caustic. The ulcerated parts should be kept as dry as possible; and he recommends iodoform mixed with tannin or wood charcoal to deodorise the affected areas.

THERAPEUTICS.

UNDER THE CHARGE OF
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The Action of Bromide of Ammonium.

Charteris finds, from experiments on rabbits and pigs, that the bromide of ammonium is much more toxic than the bromide of sodium. When large doses are given, the predominating action is produced by the ammonium. This is true, whether the drug is given by the mouth, or by subcutaneous or intravenous injection. In each case, if given in sufficient amount, the bromide of ammonium causes convulsions and death, usually from respiratory failure. The effect on the intact mammalian circulation is that of a marked stimulant, causing a great but transient rise of blood pressure. At the same time the rate of the heart is slowed, and the individual beat is more powerful. With repeated non-toxic doses a bromide action can be produced. These experiments show that no benefit is obtained by using the combination of ammonium with bromine, as the stimulant action of the ammonia passes off within a few minutes. As a matter of fact, there is no need for such stimulant action on the circulation if the bromide of sodium be used, as this salt is almost without any depressant action on the circulation. As much as 60 grs. can be injected intravenously within an hour without materially lowering the blood pressure.—*Therap. Gaz.*, Phila., 1905, November.

Has Formic Acid a Stimulant Action on Muscular Tissue?

The estimation of the therapeutic value of the salts of formic acid has passed through many phases. At one moment they are enthusiastically praised; at another they are relegated to the rank of useless drugs. Recently, chiefly through the writings of Garrigue and Clément, marvellous therapeutic effects have been ascribed to the salts of formic acid. According to the last-named writer, formic acid increases the muscular force, as well as the power of resisting fatigue; while muscles in a state of fatigue regain their activity very rapidly under formic acid treatment. Fleig has carried out a large number of experiments on the muscles of rabbits and frogs, as well as in healthy men, but is utterly unable to substantiate the claims of Clément. He is unable to find any action produced by formic acid, either upon the muscular force or on the power of normal muscle tissue of resisting fatigue. He is quite certain that formic acid causes no peripheral stimulant action on the muscle fibres. Similarly he finds that formic acid is devoid of stimulant action on the central nervous system. From careful experimenting with the ergograph, he is satisfied that the marvellous results described by Clément are due, not to formic acid, but to training, resulting from repeated muscular action.—*Arch. gén. de méd.*, Paris, 1905, Nos. 44 and 45.

INJECTION OF SEA WATER.

THE beneficial effect of seaside life on tuberculous states has been ascribed to various factors. Thus it has been stated that the beneficial action is due to the constancy of temperature, luminosity, maximum of barometric pressure, purity of atmosphere, etc. Recently a new factor has been insisted upon by Quinton. He ascribes the benefit to the fact that the marine atmosphere holds variable proportions of sea water, containing salts, in suspension. He has further shown that sea water possesses a high value as an organic medium, acting as a regenerator of cells. Recently a school has grown up who advocate the direct injection of sea water in tuberculous cases. They claim that by means of these injections exactly the same beneficial effects are produced as in the first few days of a residence at the seaside, but in much more marked and abrupt manner. The amount of sea water injected varies from 100 to 200 c.c. More than this produces an unpleasant reaction. Prior to injection, the sea water is diluted with equal parts of spring water, and sterilised in the cold, as heat alters the molecular state and destroys the organic activity of sea water. Simon has tested the value of this method of treatment on eighteen unselected cases of tuberculosis, which were treated in Paris in the midst of winter. The results which he records are remarkable. All the cases show great increase in weight and improvement in objective symptoms, despite the fact that in many cases there had been previously a steady loss of weight. In three of the cases the treatment had to be stopped, but in the remaining cases it was carried on for long periods, varying from one to three months. Seven of the patients formed a group representing the first stage of phthisis. In it the average daily gain in weight for each case was 27·6 grms. Three patients in the second stage showed an average gain of 24·6 grms., and three in the third stage one of 35·17 grms. The improvement in symptoms was no less striking—cough became less, the appetite improved, and the patients slept better. Sea water also appears to act as a powerful stimulant in other non-tuberculous morbid conditions, as in a group of nine people representing malarial cachexia, gastro-intestinal and gynæcological condition, the average daily gain was 77·5 grms.—*Journ. Balneol. and Climat.*, London, 1905, October.

Iothion.

All writers who have described the action of this preparation agree that the cutaneous application results in the absorption of large quantities of iodine. Though mild symptoms of iodism may occur, as slight acne formation and nasal catarrh, the gastro-intestinal tract is not upset. On the other hand, the preparation has certain disadvantages. In the pure, undiluted form it is distinctly irritating, causing frequently burning sensation and irritation of the skin. In extreme cases it produces severe dermatitis, with formation of vesicles. Consequently iothion should not be used undiluted. Schindler recommends the use of an ointment, 50 parts iothion, made up with 25 parts each of lanolin and vaselin. One-tenth part of this may be rubbed in daily. The inunction takes fully half an hour, and is carried out in the same manner as mercurial inunction. The ointment should not be applied to any region which is ulcerated. The 50 per cent. ointment is suitable for cases of tertiary syphilis, and produces rapid improvement. In gonorrhœal epididymitis 5 to 10 per cent. ointments may be used with advantage, after the acute manifestations have passed off, in cases where large painful masses of exudation are left in the epididymis. The iothion is not rubbed in, but is applied spread on lint, and the application is renewed daily. Iothion has a distinct antiparasitic action, and in the form of a 5 to 10 per cent. ointment may be used in ringworm of the scalp, sycosis parasitica, and in eczema marginatum. As the new preparation is expensive, its use will be restricted to those few cases in which it is impossible to use potassium iodide.—*Heilkunde*, Wien, 1905, October.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF

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The Causation of Death in Cases of Burning.

Pfeiffer has published the results of a series of experiments upon animals which he undertook with the view of attempting to throw light upon many undecided questions in connection with the causation and pathology of death from burning. He found that the pathological changes in the body, and more especially ulceration of the intestinal canal, become better marked the longer the interval which elapses between the burning and death. He found that a special toxic substance appears in the urine in cases of burning, and that the toxicity of the urine increases after the burning, irrespective of its reaction and the blood-colouring matter contained in it. The blood serum is also toxic in a certain percentage of cases, and this toxicity increases until death occurs, and may be greater than that of the urine. The toxic body acts upon the central nervous system, first exciting it, and finally leading to paralysis of the respiratory centre. The poison has no characteristic period of incubation, and it produces necrosis of the tissues at the site of inoculation. The poison in watery solution loses its toxicity when exposed to daylight. Moderate heat also decomposes it. The poison passes through a filter, which retains bacteria. It produces its poisonous effects in white mice when absorbed through the alimentary canal, but it has no action on uninjured skin or mucous membrane. The blood changes in cases of extensive superficial burning are directly due to the injury produced on the blood by the heat, and death is the result of such blood changes. The pathological changes found in the intestinal canal arise in all probability from the action of the toxin upon the walls of the blood vessels. This toxin is formed only in the parts injured by the heat, and is an unstable body, of unknown composition. It is probably a decomposition product of the albumin molecule, and possesses some similarity, but also great differences, with certain snake poisons and nucleo-proteids.—*Virchow's Archiv*, 1905, Bd. clxxx.

A New Micro-chemical Reaction for Semen.

Barberio publishes a new reaction for the detection of seminal fluid, which may have great medico-legal importance if his results are verified by subsequent investigators. He states that, on adding to a drop of seminal fluid placed on a glass slide, half as much of a saturated watery solution of picric acid, a characteristic crystalline precipitation occurs in a few seconds. This precipitate consists of yellow, strongly refractive crystals, which have a rhomboidal needle-shaped form. They appear singly or in bundles, most frequently in the form of crosses. The reaction is said to be extremely delicate, and does not depend upon the presence of spermatozoa in the semen; while it gives positive results equally with the fresh fluid as with dry stains and also at a later period than Florence's reagent is able to do in the case of decomposing semen. No other fluid of the body gives a similar reaction. The exact nature of the crystals has not yet been determined by Barberio.—*Rendic. d. R. Accad. d. sc. fisiche e matematiche di Napoli*, 1905, April.

Putrefactive Gastric Digestion of Food.

Some years ago Ferrai showed that the process of digestion of food in the stomach continued for some time after death. This observation has considerable importance in connection with the fixation of the time when death occurred in certain medico-legal cases. Ferrai (*Ztschr. f. Med.-Beamte*, Berlin, 1905, Heft 23) now further discusses the question whether there is such a thing as alteration in the quantity and quality of food in the stomach as a result of putrefactive processes. As regards a quantitative diminution in the contents of the stomach as a result of putrefaction, he is unable to form any definite conclusion. This must be a subject of investigation in cases where bodies are found in an advanced stage of putrefaction, and in which exact data as to the time of death and when the last meal was partaken of are available. Those cases, which are by no means infrequent, in which the contents of the stomach are expelled either into the œsophagus or small intestine as a result of agonal spasmodic muscular contractions, or in which they are driven from the stomach by the pressure of the gases of putrefaction, are, of course, not apposite to the question under consideration. As regards qualitative changes, Ferrai carried out experiments on dogs which showed that as a result of putrefactive processes food became altered macroscopically and microscopically in the stomach in a manner closely simulating the effects of digestion. That is to say, the food became broken up and softened and its various components intermixed. Muscle fibres became fragmented, their ends rounded off—with partial disappearance of the striation, etc. Ferrai, as a result of his investigations, is of opinion that the action of putrefaction may cause the contents of the stomach to appear to be in a more advanced stage of digestion than actually existed at the time of death.

The Influence of Organic Dyes upon the Spectroscopic Tests for Blood.

When the spectroscope is employed as a test for the presence of blood in stains on textile fabrics, a difficulty is frequently experienced owing to the solubility of dyes, giving rise to absorption bands and thus interfering with the blood spectra. Giese has accordingly carried out a series of experiments with the object of determining the solubility of a number of the more commonly used dyes, in the fluids generally employed for dissolving blood-colouring matter in medico-legal practice.

The fluids thus taken were 10 per cent. caustic soda, 10 per cent. solution of potassium cyanide, glacial acetic acid, and concentrated solution of carbolic acid. These were tested on twenty-one various dyes, and in sixteen instances a solution of the dye occurred to such an extent as to make its characteristic spectrum visible. As a rule, basic dyes are dissolved by acid extraction media, and *vice versâ*; but there are some dyes which are soluble in both acid and alkaline solutions.

Giese recommends, in cases where a dye may cause difficulty, either that a test should be made with both an alkaline and acid extraction fluid, or that a piece of the fabric outside the blood-stained area should first of all be spectroscopically tested, so as to exclude dye spectra.

The most reliable method, however, he believes, in such cases, is to employ the hæmatoporphyrin spectroscopic test, as modified by Takayama. This is, shortly, as follows: A small piece of the fabric is placed in a test tube with 1 c.c. of concentrated sulphuric acid. After being thus acted on for five to seven days, the test tube is carefully heated for ten to twelve seconds, at the same time being constantly shaken. After being allowed to cool, 2 c.c. of water are added, and the solution is filtered. By this means it is possible to secure not only destruction of all organic matter, but also the distinct and characteristic spectrum of hæmatoporphyrin without any confusing dye spectra.—*Vrtljschr. f. gerichtl. Med.*, Berlin, Heft 4, 1905.

A Modification of the Guaiac Test for Blood.

Wile (*N. Y. Med. Journ.*, 1905, October 7), in a preliminary communication, states that it occurred to him that a better reaction would be obtained by extracting the colouring matter and testing for the hæmoglobin of the blood at one step. For this purpose chloroform seemed serviceable, and proved to be a decided improvement on the test both in point of clearness and delicacy.

To equal parts of chloroform and turpentine, tincture of guaiac (U.S.P.) is added, a drop at a time, until slight milkiness appears. To 2 c.c. of this reagent the suspected solution is added, and the mixture is thoroughly shaken. In the presence of blood the chloroform-turpentine-guaiac solution becomes blue. The colour takes a few seconds to manifest itself, but gradually deepens until all the hæmoglobin has entered into the reaction. The colour then gradually becomes lighter, and slowly disappears. This chloroform modification gives a clearly defined reaction, and is more delicate than the simple peroxide of hydrogen-guaiac reaction. For example, a $\frac{1}{2}$ c.c. of a 1 to 40,000 dilution of blood in urine gave a positive reaction in a very few minutes using the chloroform-turpentine-guaiac method, while a 1 to 10,000 dilution of blood in urine failed to react with the peroxide-guaiac test.

Poisoning by Potassium Bichromate.

Criminal poisoning by potassium bichromate is so rare that the following case has considerable interest.

A man, who was employed in a tannery where bichromate of potassium was used in the tanning process, proposed to his wife and children to have a good time. Beer, port wine, and rasberry syrup were therefore bought. The man drank only the beer, while the wife and children partook of the port wine and syrup. The first drink of the port produced an immediate effect on the children—pains in the epigastric region, headache, vomiting, and purging—so that they refused to take any more. The woman, however, continued to drink. She soon was seized with severe vomiting, convulsions, pain in the stomach, dizziness, headache, cold sweats, and diarrhœa. She was left in this state until next morning, when her husband gave her some tea. She at once complained of burning pain in the stomach, and noticed a peculiar orange-red powder in the cup. When a doctor arrived, three hours later, she was practically moribund—face pale, pupils dilated, respirations slow and laboured, pulse 56, and her lips, chin, and tongue were stained yellow in colour. The bed-clothes and a towel were also discoloured a light green, presumably from vomited matter. The urine contained a considerable quantity of blood and albumin. The patient eventually recovered.

The presence of potassium bichromate was fully proved in the bottle containing the port wine, and it was estimated that at least 100 grs. must have been taken by the patient. Crystals of the salt were found in the waistcoat pocket of the husband, and the crime was clearly brought home to him.—*Am. Med.*, 1905, March 4.

DISEASES OF THE EAR, NOSE, AND THROAT.

UNDER THE CHARGE OF
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AND
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The Surgical Treatment of Suppurative Lepto-Meningitis Secondary to Middle Ear Suppuration.

This subject has recently received considerable attention, and the value of lumbar puncture both as a means of diagnosis and as a therapeutic agent has been discussed by various writers. In approaching the question of meningitis of aural origin from the surgical standpoint, it is very necessary to have a proper conception of the variety of the inflammation that may be present, to arrive, if possible, at a correct diagnosis of the existing conditions, and to become acquainted with the kind of organism which is responsible for the meningitis. When these points have been as far as possible elucidated, the surgeon is then able to approach the question of treatment in a more scientific manner.

Friedrich of Kiel has contributed an interesting article on the surgical treatment of meningitis consecutive to middle ear suppuration (*Deutsche. med. Wchnschr.*, Leipzig, 1904, August 4). In it he has attempted to classify meningitis into two varieties. In the first there is a short prodromal period characterised by headache, dulness of intellect, nausea and vomiting, a period which is soon followed by evidence of a general infection of the subarachnoid space, with high temperature, coma, delirium, rigidity of the cervical muscles, convulsions, etc. In other words, there is a diffuse suppurative meningitis extending over the general surface of the cerebral cortex as well as over the base and into the spinal canal. The second variety is characterised by a less violent onset and by slower progression. The higher centres of the brain remain for a long time unaffected, sometimes even until death. The patient continues to take nourishment, the rectum and bladder retaining their normal functions, while the temperature is only moderately elevated. In this class of case the inflammation affects the base along with the ventricles and the subarachnoid space of the spinal cord, the convexity of the cerebral hemispheres remaining unaffected.

Friedrich states, further, that as the result of post-mortem examination, it is found that in the first variety the infection spreads from the middle ear rapidly by way of the labyrinth and the internal auditory meatus. In the second variety, where the meningeal infection is of a more limited character, it is consecutive to a chronic middle ear suppuration, often accompanied by cholesteatoma. It sets up an osteitis which progresses slowly, and gradually perforates the osseous table, and sets up an intracranial infection of the nature of an extradural abscess. Before the subarachnoid space is invaded, a protecting layer of adhesions has been formed, and thus the lepto-meningitis may be a limited one in the first instance. A more general inflammation may supervene upon this. According to the author, if the suppuration has not reached the general surface of the hemispheres, it is amenable to surgical intervention.

Clinical experience demonstrates the fact that in many cases it is difficult to recognise two such distinct types of meningitis as those above outlined. Moreover, the association of sinus phlebitis with meningitis in a number of cases complicates the diagnosis. Voss of Koenigsberg, in a valuable paper, written in the *Charité-Ann.*, Berlin, 1905, deals with the question of diagnosis by means of lumbar puncture and the value of an examination of the cerebro-spinal fluid. The first point which he raises in this connection is whether any significance is to be attached to the presence of leucocytes in the fluid, and he concludes that the existence of leucocytes, whether mono- or poly-nuclear, are not sufficient to establish a diagnosis of diffuse suppurative meningitis even when the patient presents the clinical features suggestive of that affection. In support of this statement, Voss cites a case of his own, and quotes similar cases from two other authors, in which lumbar puncture revealed the presence of leucocytes in the cerebro-spinal fluid, but on post-mortem examination no macroscopic evidence of intracranial meningitis was observed. Luc of Paris, in an excellent review of Voss's paper (*Ann. d. mal. de l'oreille, du larynx, etc.*, Paris, 1905, November), points out that it is unwise to conclude from naked-eye examination only that no meningitis exists. Putting aside the question of the significance of leucocytes in the fluid, we turn next to consider the value which is to be attached to the presence of micro-organisms in the cerebro-spinal fluid. The majority of observers would regard the existence of organisms in the fluid removed by lumbar puncture as proof of the presence of a diffuse meningeal inflammation in patients presenting the clinical phenomena of such. On this point, however, Voss makes the interesting statement that the presence of bacteria in these patients does not necessarily imply that diffuse meningitis is present, but that they be associated with a circumscribed meningeal inflammation. He details three interesting cases of middle ear suppuration, in which symptoms supervened strongly suggestive of an intracranial meningeal infection, but as recovery occurred in all of them, no actual proof of this was forthcoming. In all of them diplococci were found in the cerebro-spinal fluid. The conclusion arrived at by the author is that the organisms pass from the ear to the meninges, but under certain conditions their virulence becomes attenuated, and they fail to produce a suppurative meningitis. Further, the presence of bacteria in the cerebro-spinal fluid may not even signify a meningeal affection.

In cases of suppurative sinus phlebitis, bacteria have passed into the circulation and thence into the subarachnoid space without giving rise to any fatal meningeal infection. The author has seen patients cured of sinus phlebitis in whom organisms have been found in the spinal fluid. Voss indeed makes the statement that in nearly one-fourth of the cases of sinus phlebitis not complicated with meningitis, the fluid removed by lumbar puncture contains bacteria.

The value of a diagnostic puncture is still further weakened by two other observations made by Voss. In two patients from whom cerebro-spinal fluid was withdrawn, organisms were found in the fluid, but in neither of them was there sinus phlebitis or meningitis. Their cases may be briefly quoted. In the first, the patient suffered from a general infection due to pneumococci of pulmonary and aural origin. The autopsy did not reveal either meningitis or sinus phlebitis. The second case was that of a child, æt. 8 years, who in the course of a severe attack of scarlet fever developed a middle ear suppuration complicated with mastoiditis and with œdema over one-half of the cranium. The fluid withdrawn by lumbar puncture contained a number of red cells, very few leucocytes, and some diplococci with streptococci in short chains sparsely scattered throughout the field. It was found on operation that the inflammation had extended to the squamous temporal, causing a marked osteitis of the bone: the child recovered without having presented any sign of meningitis or sinus phlebitis. Voss attributes the organisms in the cerebro-spinal fluid in this case to the scarlatina infection generating in the otitis.

If certain conditions tend to weaken the value of lumbar puncture as a diagnostic agent, there is no doubt that an examination of the fluid obtained in this way is an important factor in assisting the surgeon to make a more accurate prognosis. The variety of micro-organisms found in the cerebro-spinal fluid influences the opinion that must be formed with regard to this point. Of fifteen cases of meningitis collected by the writer, which were cured either spontaneously or by operation, ten showed the presence of diplococci in the spinal fluid, three staphylococci, one contained an organism resembling the *Bacillus coli*, while the nature of the organism in the fifteenth was doubtful. In no case has a cure been reported in which the streptococcus was the virulent organism.

The treatment of suppurative meningitis is discussed not only by the two writers already quoted, but also by von Hinsberg of Breslau (*Ztschr. f. Ohrenh.*, Wiesbaden, 1905). Friedrich is of the opinion that if the meningitis has not reached the general surface of the cerebral hemispheres, it is perhaps amenable to surgical interference. In two cases he has carried out somewhat energetic treatment. In both instances a fatal termination ensued. The original seat of the infection, the middle ear and mastoid antrum, were freely exposed, and the cranial dura mater was opened in that situation. A large counter opening was made through the lower part of the spinal dura mater by removing the laminæ of the vertebræ. This latter procedure was only undertaken after repeated lumbar puncture had failed to do more than give transitory relief. As both the patients died after the major operation, further experience is required before such a procedure can be recommended. Voss, in approaching the question of operation, favours repeated lumbar puncture after the original focus of suppuration in the ear has been dealt with. He draws attention to the fact that the symptoms may be aggravated by this procedure. In one case, after lumbar puncture, a fatal coma followed. In another, a meningitis which had apparently become quiescent for some weeks was lit up by the puncture. It again settled down, and the patient recovered. In a third case, that of a child who died from a pneumococcal infection, there was found, at the post-mortem examination, an intra-arachnoid hæmorrhage at the apex of the right temporo-sphenoidal lobe, which was regarded as consequent upon the lumbar puncture.

Von Hinsberg deals at length with the question of operative treatment, and is in favour of opening the dura mater as near as possible to the site of the original infection, after the manner practised by Macewen. He quotes the experience of a number of surgeons, whose cases include those followed by recovery and those which terminated fatally. The essential point, according to the author, is to lay bare and open the dura mater as early as possible after the commencement of the meningitis, and at the same level as the point of the original infection. He insists further that the bone and the dura should be opened over an area proportionate to the apparent distribution of the pial infection. When the inflammation affects the convexity of the hemispheres, this is more feasible; but he recognises the difficulty in those ear cases in which, from the commencement, the base of the hemisphere is affected. Experience teaches that when the meningitis affects the middle fossa of the skull, and is attacked early in its course, it can still be arrested. With regard to operations upon the cerebellar fossa, the author recognises that up to the present there is insufficient evidence to admit of a definite opinion regarding the success of treatment in these cases. Jansen and others have entered the cerebellar fossa through the area of bone on the posterior aspect of the petrous temporal, which lies behind the labyrinth. Hinsberg opened the subarachnoid space through this area in a case of limited meningitis in the posterior fossa; but the patient died from cerebellar abscess. The meningeal condition for which he had been operated upon was found to have been arrested. Where the meningitis has become more general, Hinsberg advocates the opening of the dura at a more dependent point; as, for example, in the lower part of the occipital region. The dangers which may attend such operations are hernia cerebri and the lighting up of a general meningitis. Further, the difficulty in arriving at a precise diagnosis causes the surgeon to delay interference, and thus to lessen the chances of his success.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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Antimony in Bottled Beverages.

Attention has recently been drawn to the presence of antimony in beverages sold in bottles provided with stoppers having rubber rings to make them fit tightly. The antimony is derived from the rubber rings, which contain a considerable proportion of sulphide of antimony. Thresh (*Pub. Health*, London, vol. xviii. No. 2) gives the results of experiments conducted by him to ascertain whether beverages bottled in this manner contained antimony in quantity capable of exerting evil effects on the consumer. From consultation of authorities, it seems probable that the frequent ingestion of 1 mgrm. or less of antimony may produce bad effects. Some persons, according to Allbutt, exhibit a peculiar idiosyncrasy towards antimony, but the information available as to the effects of minute traces of the poison is by no means extensive.

The samples of the beverages (soda water, lemonade, ginger beer, ales, stouts, and Australian wine) were bought in the East End of London. A dozen bottles of each kind, with the exception of the wine, were examined. Each dozen, for purposes of examination, was divided into half-dozens—one with the stoppers showing least wear, and the other with the stoppers showing the greatest signs of wear, these being examined separately. The beverages were filtered through filter paper, the filtrate and residue being separately examined for the presence of antimony.

The following table shows the results obtained :—

Beverage.	Weight of Rings in Grms.		Filtered Liquid.	Deposit from Liquid.	Quantity of Liquid used.
	Maximum.	Minimum.			
Soda Water—					
New rings . .	1·14	...	No antimony	No antimony	36 oz.
Old ,, . .	...	1·00	,,	,,	36 ,,
Lemonade—					
New rings . .	1·75	...	,,	,,	60 ,,
Old ,, . .	...	1·05	,,	Trace antimony	60 ,,
Ginger Beer—					
New rings . .	1·51	...	,,	No antimony	68 ,,
Old ,, . .	...	0·99	,,	Trace antimony	78 ,,
Ales—					
New rings . .	1·67	...	,,	Slight trace antimony	97 ,,
Old ,, . .	...	1·13	,,	Trace antimony	73 ,,
Stout—					
New rings . .	1·67	...	,,	No antimony	104 ,,
Old ,, . .	...	1·00	,,	,,	104 ,,
Australian Wine	...	...	,,	,,	5 ,,

From this it will be seen that no antimony was found in any of the beverages after filtration. Antimony was, however, found in four cases in the deposit filtered out of the liquid, and in three of these cases the rubber showed signs of wear. In only one case was antimony found where the stopper showed no signs of wear. Dr. Thresh considers that "it is almost certain that on occasions large pieces of rubber will become detached, as this material becomes less elastic, if not actually brittle, with age."

Experiments were also made with the rings—(1) By boiling in soda water, and (2) by boiling in a solution of tartaric acid. The soda water contained, after filtration, no antimony, but the residue on the filter paper gave an average of 1 mgrm. of antimony per ring. The tartaric acid solution contained about 0·7 mgrm. of antimony in solution from each rubber ring. From these experiments, the solubility of the sulphide of antimony seems to be so slight that the danger arises from detached particles, especially when the rings become old. Dr. Thresh considers that the use of such rubber on stoppers cannot be considered as entirely without danger, and that "some form of rubber, free from such poisonous ingredient, should be employed, or some substitute for rubber adopted." In conclusion, he says, "it is possible that the danger has been exaggerated, but this can only be determined by continued observation," and suggests that medical men, and especially medical officers of health, should report any observations tending to prove or disprove the opinions expressed by Mr. Ponds of Liverpool, who thinks that the presence of antimony compounds in beverages bottled in this manner may be a cause of appendicitis, and possibly of other obscure intestinal affections.

Water-borne Typhoid Fever.

A. Nyman (*Hyg. Rundschau*, Berlin, 1905, p. 225) gives the details of what he considers an epidemic of water-borne typhoid fever occurring in the district of Höganäs, Sweden. In the summer of 1902, there were some sporadic cases of the disease; but in the end of December of that year there was an explosive outbreak. From that time to the end of February 1903 there were eighty-four cases in a population of 4000 inhabitants. Of these cases, thirty-nine were in adults, with five deaths, and forty-five were in children under 15 years of age, with three deaths. The district comprises several thickly populated small townships. Two of these, distant the one from the other about 1 kilo., were affected. These both belonged to a large company which worked the coalmines and brickworks, and were supplied with water from the bottom of a certain mine. The water was pumped in great abundance to four tanks, from which it passed to a sand-filter, whose working was not above suspicion. This water is certainly pure at its source, but is much exposed to pollution in its passage through the mine, where there are 330 workers employed, and where twenty horses are constantly stabled. Two miners attacked with typhoid fever continued working in the pits during the incubation period of the disease. The first took to bed at the end of October. He confessed to having defæcated in the gutters of the galleries. The second miner only took ill about a month later, and did not work in the same mine as the first, and lived in a township where several cases of typhoid had appeared during the summer. He was, moreover, a careful man, who had always used the pit latrines. It would appear that the water supply had been polluted by the fæcal matter of the first workman, though there is room for wonder at the long interval of time (two months) between that case and the outbreak of the epidemic. The epidemic was, however, so strictly limited to the districts supplied by this water, that it is difficult to attribute it to any other origin, especially since the rest of the population were unaffected, with two exceptions. These were a schoolboy, who could have drunk the contaminated water at school, and a shoemaker, who used sewage water for watering his garden.

Vapour of Alcohol as a Disinfectant.

In extension and confirmation of the experiments of V. Brun, Frank, and de Satta, Ewald (*Hyg. Rundschau*, Berlin, 1905, p. 61) has carried out a number of experiments on the value of alcohol vapour as a disinfectant. In these experiments, the temperature was kept at from 40° C. to 45° C., the organisms experimented with being *Bacillus diphtheriæ*, *B. typhosus*, *Streptococcus pyogenes*, and *Staphylococcus pyogenes aureus*. The strength of alcohol employed varied from 20 per cent. to absolute alcohol. Numerous glass plates, on which pure cultures of the various organisms were spread, were exposed to the vapours for from one to five minutes, after which the coatings of the plates were sown on nutrient agar and incubated, and by comparison with control plates the effect of the vapour of alcohol on the exposed micro-organisms was determined. It was found that the organisms above referred to were killed by exposure to the vapour from alcohol solutions of 40 to 90 per cent. in one minute, while exposure to the vapour from 30 to 40 per cent. alcohol and from absolute alcohol for from two to three minutes was necessary to obtain the same result.

Anthrax spores required six minutes' exposure to the vapour from 50 to 80 per cent. alcohol,—the most active dilution being apparently 60 per cent., which killed the spores in five minutes. In practice, alcohol of 50 per cent. or 60 per cent. is to be preferred as a disinfectant. From the experiments, it appears that a certain amount of water is necessary, in order to render the vapour of alcohol more energetic and effective as a bactericidal agent.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Medico-Chirurgical Society.—*January* 17, 1906.—Dr. Affleck, President, in the chair.—Dr. James Cameron showed a strangulated testicle, from a case of strangulated hernia in an infant of six weeks.—Dr. Douglas Wilson (Harrogate) showed radiograms of hands, from a case of tophaceous gout.—Captain E. D. W. Greig, of the Indian Medical Service, read a paper on "The Sleeping Sickness of Uganda." This disease first broke out in Uganda in 1900, and since then 100,000 individuals had died. Enlargement of the lymphatic glands, more particularly those in the posterior triangle of the neck, is the earliest symptom. These glands frequently attain a considerable size, and form noticeable tumours. The nervous symptoms set in much later, and are accompanied by fever, which persists till near the end. When the nervous symptoms are established, the patient has a peculiar, sleepy look; the tongue is tremulous, and the gait ataxic. Sleeping sets in in the last stage, when the patient is reduced to skin and bone, and is covered with sores. The characteristic organism of the disease is the trypanosome. It is present in the enlarged glands from the outset, but is only found in the cerebro-spinal fluid from the time the nervous symptoms manifest themselves. The organism causes a proliferation of the mononuclear lymphocytes in the perivascular lymph spaces, and the resulting anæmia of the brain is the cause of the sleeping. The disease is spread by the tsetse fly, in whose stomach enormous numbers of trypanosomes are found. It has also been shown that the sleeping sickness area coincides with the area infested by the tsetse fly. There can be no doubt that sleeping sickness was imported from the West Coast, where it has been known to exist for at least a hundred years, into Uganda when that country was opened up to caravan traffic some five years ago. The paper was illustrated by lantern slides.—Mr. G. L. Chiene read a paper on "The Use of Stovaine as a Spinal and Local Anæsthetic." He had used stovaine in fourteen cases: in two he failed to get the needle into the canal; in three a small quantity of chloroform had to be given towards the end of the operation; in the remainder the anæsthesia was complete throughout the operation. As a local anæsthetic, stovaine possesses no marked advantage over weak solutions of cocaine.—Dr. Theodore Shennan read a paper on "The Relation of Spirochæte Pallida to Syphilis." There are two main forms, the *S. pallida* and *S. refringens*. The *S. pallida* is found in syphilitic buboes, papular syphilides, and other similar lesions. It is a delicate organism, and stains with difficulty. It is filamentous and spiral in shape (like a corkscrew). *S. refringens* is of a saprophytic nature. It is thicker and more refractile than the pallida. It stains very easily. The *S. pallida* is probably the important one, and that it is the specific organism of syphilis is supported by the fact that it is found both in primary and secondary syphilitic lesions, and in the blood in congenital syphilis. It is not found in the tertiary lesions. Experimental sores produced in chimpanzees were found to contain the spirochæte. Control observations were made to prove the absence of spirochæte from various lesions of the skin and mucous membranes of a non-syphilitic nature. The paper was illustrated by lantern slides.

EDINBURGH OBSTETRICAL SOCIETY.—*January* 10, 1906.—Dr. J. W. BALLANTYNE, President, in the chair.—The SECRETARY read a paper by Dr. FOTHERGILL of Manchester on "A Case of Eclampsia, followed by Puerperal Melancholia, which was treated by Thyroid Substance." The patient was a primipara, æt. 44, who had been married for three years. Before her confinement the urine contained a trace of albumin, and there was slight œdema of the hands and feet. Labour was normal till the head was on the perinæum, when a violent eclamptic fit occurred. Chloroform was administered, and the child delivered by forceps. As the pulse was full and strong, the placenta was partially separated, and bleeding allowed to the extent of 15 oz. Then the placenta was removed entire. Sixteen hours later another violent fit occurred, and the patient was again bled, and 18 oz. of blood allowed to escape. After this the patient improved, and the albumin disappeared ; but on the fifteenth day the temperature rose, and the patient became melancholic ; her speech was unintelligible, and she refused food. The pulse became very slow, being sometimes only 46 per minute. Thyroid extract was administered, and the condition of stupor gradually passed off, and the patient became quite well.—Dr. BARBOUR SIMPSON read a paper on "The Use of the Stereoscope in the Teaching of Obstetrics and Gynæcology." Specimens of stereoscopic photographs were shown, and the advantages of the depth given to the pictures pointed out. It was also shown how the photographs would be useful in illustrating operative procedures.—Dr. PORTER read a paper on "Pyuria in the Female." Three hundred specimens of urine had been examined, and in 1 in 4 pus cells were found. He described the tests he had applied, and also noted the different bacteria which were present. He considered that pyuria in its mildest form was a septic condition, and that leucorrhœa should be regarded as a common source of infection. Dr. Porter held that it was advisable to examine the urine of all pregnant women, for pus as well as for albumin. The paper was illustrated by reference to cases which had been under his care.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*January* 8, 1906. —Professor MUIR, President, in the chair.—Dr. KERR LOVE gave a demonstration of the methods employed to show the existence of residual hearing in the deaf and dumb. He explained the methods adopted in teaching the pupils—(1) oral method, (2) manual method, (3) oro-acoustic method ; and referred to the necessity of good eyesight, good intelligence, and to the effect of the presence of hearing in the acquisition of speech. The materials which the teacher had to deal with were those of the congenitally deaf and the acquired deaf ; and the objects of the teacher to restore the deaf child to intercourse with the largest number of his fellows, and to enable him to interpret the largest number of ideas. The clinical study of the material showed that in 25 per cent. of the children valuable residual hearing was present. The bell, whistles, tuning-forks, and Galton's whistle were used in testing the children. Seven illustrative cases were shown to the Society.—Dr. ALEXANDER NAPIER showed a case of lupus verrucosus, which was being treated by curettage and tuberculin injections.—Dr. JAMES LAURIE described a case of suprapubic prostatectomy for malignant disease. The patient was a man, æt. 77, whose bladder symptoms dated for about seven months, and in whom a large sarcomatous growth, weighing 2 lbs. 6 oz., was present. The tumour was successfully removed, and the patient has made satisfactory progress; the specimen and microscopical preparations were shown by the President.—Dr. I. S. M'Kendrick read notes of a case of marked paroxysmal dyspnœa occurring in a patient with double aortic disease, and wherein, after death, were disclosed striking appearances of chronic mediastinitis.

Glasgow Medico-Chirurgical Society, *January* 12, 1906.—Dr. G. B. Buchanan read notes on a case of death from acute ascending paraplegia (Landry's paralysis), occurring in a patient suffering from prostatic hypertrophy, complicated by pyuria and enlargement of both kidneys.—Drs. Leslie Buchanan and W. Ernest Thomson read a short paper upon "Injuries to the Eye of the Child during Labour." Dr. Ernest Thomson dealt principally with corneal lesions. Lines or stripes were first noticed, usually vertical in direction. Later the cornea became denser, till it was almost white, and the lines could no longer be seen. Then the cornea gradually cleared, till the lines again became visible, and the opacity ultimately disappeared. The lines were due to rupture of the posterior elastic lamina. In the more severe cases, the prognosis was rather grave as regards the ultimate effect on the vision.—Dr. A. Lewis M'Millan read a short note on "Intracapsular Cataract Extraction," and showed a patient from whom he had removed the lachrymal sac.

ANALYTICAL REPORTS.

Moseley's Food and Moseley's Cocoa.

(Foods Limited, Stockport.)

Moseley's food is one of the cereal foods of which so many are now in the market. It presents the advantage of a comparatively high proteid content (14·78 per cent.), and is also somewhat rich in phosphates. Of the 69 per cent. of carbohydrates, 21 per cent. is present in soluble form. In all such preparations the amount of fat is necessarily low; in this food it is present to the extent of 1·84 per cent., and the proprietors wisely recommend that where the preparation is employed as a food for infants, milk and cream should be added. When made according to the directions, we found it a palatable dish; its composition shows it to have considerable nutritive value, and as it is easily prepared and readily digested, it should form a useful adjunct to the dietary of the sick-room.

Moseley's cocoa is a combination of the above food with pure cocoa of excellent quality. The preparation has all the appearance of ordinary cocoa powder, and is extremely soluble, little or no residue being left in the cup. The beverage prepared from the powder has the delicate flavour characteristic of the finer varieties of cocoa, and is free from the harshness which makes some brands so distasteful. The addition of the food gives a nutritive value to the beverage which ordinary cocoa does not possess, and this without in any way impairing the refreshing qualities of the pure product. For invalids and convalescents especially it ought to prove a valuable food and stimulant.

LETTER TO THE EDITOR.

To the Editor *of* "The Edinburgh Medical Journal."

The Food Factor in Disease.

Sir,—I trust you will allow me a few words in answer to the review of my book, "The Food Factor in Disease," which appeared in your January issue. I am charged with asking the reader to "swallow the initial assumption upon which the theory (of hyperpyræmia) rests." I submit I have not done so. I have asked the reader merely to hold tentatively before him a provisional hypothesis for the purpose of testing it. Nor does the theory *rest upon* any assumption. It rests upon the large number of thoroughly authenticated facts which it is capable of explaining, but which the review excludes from serious consideration.

Your reviewer refers to the recent work of Professor Chittenden, whose conclusions he infers are in necessary conflict with mine. Yet it happens that that eminent physiologist has already accepted in unmistakable language the fundamental truth of the theory of hyperpyræmia. My book has been in private circulation for about twelve months, and Professor Chittenden has very kindly allowed me to make use of the following extract from his letter of 12th September last:—"I have no doubt that the main part of your thesis relating to the blood state or blood states under the term of 'hyperpyræmia' is correct."—I am, etc., Francis Hare.

12*th January* 1906.

[The "provisional hypothesis" to which Professor Hare refers is, I take it, that an excess of carbonaceous material can accumulate in the blood; but, as I said before, to those who are not prepared to admit this, in the absence of definite chemical evidence, no piling up of chemical facts, which *might* be explained if such an accumulation does occur, can ever be convincing. In the review it was stated only that Professor Chittenden's views *on the proteid standard* are different from those of Professor Hare. The latter says (vol. ii. p. 377): "Speaking generally, I am inclined to regard the quantity (*i.e.* of proteid) set down in standard dietaries as inadequate on the average." Now, it is well known that Professor Chittenden considers the quantity of proteid in standard dietaries to be excessive. Surely no two conclusions could be more directly in conflict than this. The conflict of views is emphasised when one remembers that Chittenden finds in an excessive consumption of proteid an explanation of many of those very diseases which Professor Hare regards as due to an over-consumption of carbonaceous food.—The Reviewer.]

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

Schools for Cripples and Mental Defectives.

It is a popular superstition that every seventh year finds the body renewed in all its members; the alteration in the public mind which the last septennium has seen might suggest that some such process takes place in the body politic. The nation has had many rude awakenings since the summer of 1899, and to compare the mental outlook then and now is to become conscious of a change no less remarkable than that alleged in the old saying. Whatever the historian of the future may have to say of the South African War in its political consequences, he will recognise among the results of the heart-burnings it produced, the growth of a conviction that though modern economic conditions may make for wealth, they have not promoted the physical well-being of the race in corresponding degree. Physical improvement, then, is much in the air at present, and just as we feel nowadays that the State must not only instruct the minds but develop the bodies of its children, so we are beginning to realise that this duty has its converse in special attention to the educational needs of the physically and mentally defective. And it must be admitted that, much as Scotland has to be proud of in her educational system, she has something yet to learn from England in the matter of schooling for the crippled and mentally backward.

A child disabled by deformity, by organic disease, or by extreme delicacy—in a word, a cripple—cannot reap much advantage from the ordinary education which the State provides. If he can walk to school at all, it is with difficulty, and not in all weathers; when he gets there he finds benches ill suited to his deformed spine; school work adapted for more active companions; none of the attention which he so greatly needs. In a thousand ways his misfortunes are brought home to him—he is less a pupil to be taught than an object-lesson in kindliness to his fellows. *They* may benefit, but he . . . Small wonder, then, if a badly crippled child receives no proper education, unless under exceptional home conditions. Yet all this can be overcome by the provision of suitable cripple schools, such as are in operation in London and other large towns. The first of these schools opened by the London School Board in 1899 was one previously instituted by Mrs. Humphry Ward at the Passmore Edwards Settlement; in 1903 there existed eight, while nineteen were projected, the total number of pupils anticipated being 1380. The initial difficulty of locomotion is met by the provision of an ambulance to convey the children to school; a nurse accompanies this, and also dresses wounds, arranges splints, and generally attends to the needs of the children during school hours. The schoolroom is fitted with invalid furniture as well as ordinary desks and benches; the teachers are specially selected and paid on a higher scale than usual; the course of instruction is modified by the introduction of manual and art work, for which, as is well known, many cripples display special aptitude. Whatever may be thought as to the desirability of supplying meals to Board scholars in general, it is quite obvious that the cripple school must see to the feeding of its pupils; at present this is done by voluntary endeavour, to which the parents contribute. Such, in brief, is the working of a London cripple school, and it is apparent that its ultimate success will be greater or less in proportion as outside philanthropy co-operates with the educational authority. First come organisations such as Cripples' Aid Societies, which conduct playrooms out of school hours, assist pupils who have left school in obtaining employment, and, no less important, organise systematic visitation of the cripples; this, with the nurse's work, makes the cripple school a centre for home relief. Attendance at a cripple school involves regular medical examination, and the keeping of records, which are a valuable aid when surgical treatment is required; in fact, in at least one orthopædic hospital a cripple school has been established. In a word, the aim of the school is to treat the pupils, so far as may be, as if they were normal, particularly to correct the morbid temperament which perpetual competition with healthy children is apt to engender, to make them happy, and to enable them to earn a livelihood. So successful have the London schools been, that a number of former pupils now hold Art and other scholarships of different kinds.

The schooling of the mentally defective raises more complex problems. The English Elementary Education (Defective and Epileptic Children) Act of 1899 permits the compulsory education at special schools of children who, neither imbecile nor merely backward, are mentally incapable of receiving benefit from ordinary instruction. At first glance the definition seems to exclude many suitable cases, but in practice the net is cast pretty widely, and both imbecile and backward children are dealt with. In schools for defectives, arrangements have to be made for the conveyance, washing, and feeding of the pupils; medical supervision ensures the treatment of any curable physical ailment. The instruction—reading and articulation, writing, drawing, singing, drill, cooking, knitting, rug and basket making—is largely manual, and graded to suit the abilities of the scholars. Boys and girls are taught together, and are divided into three grades of mental capacity. But the difficulties are many. The teacher of mental defectives must possess infinite patience and unflagging enthusiasm; she must never teach in a mechanical fashion, but constantly be on the alert for any trace of latent talent. Again, the same supervision is needed in playground as in classroom, for games as well as lessons have to be taught. One of the great difficulties in training is that of the classification of the pupils. Unfortunately, the very cases which would most benefit—those who approximate to the normal—are precisely those who, owing to the natural disinclination of parents to admit that anything is wrong, are retained at ordinary schools, to their own and others' detriment, and afterwards swell the vagrant and criminal class. Then again, if capacity to earn a livelihood be made a criterion of success, it must be confessed that failure is writ large on the record of schools for defectives, for only a small proportion of the pupils become self-supporting.[1] The fact must be faced that no amount of instruction will make the imbecile's brain normal, and that his after-care rests on the charity of friends or the philanthropy of the community. But, even conceding so much, the special school is more than justified. Admit that the defective is not improvable beyond a certain limit, who shall say what that limit is? Every imbecile can be taught, at least to be happier, and his school training makes his home life less burdensome for all. Ultimately two grades of schools will probably be found necessary, one for children who with special care may become wage-earners, the other for imbeciles who will require constant after-care. For moral imbecility residential schools seem the only solution; these are also needed for the imbecile children of neglectful parents. The whole question of the education of defectives is so closely interwoven with the wider matter of the care of idiots and imbeciles in after-life, that some hold the true solution to be the removal of all these children to residential schools as a preliminary to permanent detention in colonies or institutions. We believe, however, that the day-school system will find more favour, and rightly so, for the majority of cases.

The law relating to the education of defectives has the fault of being permissive; it ought to be compulsory, at least as regards urban authorities. A still further extension of the school age beyond 16 would also be an advantage, as it would admit of longer specialised manual training for the more hopeful cases. who would thereafter be supervised by after-care associations, Of London Board scholars ·86 per cent. are defective, three-fourths of them mentally so. There is no reason to suppose that the percentage in Edinburgh is lower. In 1903 London had for 5500 mental defectives 121 schools opened or projected: in 1906 Edinburgh has none. Though no special legislation exists in Scotland, it has been found possible in Glasgow and Dundee to open such schools under the existing Education Act; surely Edinburgh will follow the example. The School Board elections are approaching; how better could the new Board signalise its accession to power than thus.

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[1] According to the London School Board Report (1903), about one-third, but this is an extremely favourable estimate.

The Pathology of General Paralysis.

The Morison lectures just delivered before the Royal College of Physicians have been of more than ordinary interest and importance. The lecturer, Dr. Ford Robertson, soared to higher flights than any of his predecessors, and presented to his audience a tentative discovery which, if it be confirmed, will form the most striking advance made in medical science since Koch discovered the tubercle bacillus. From the broad social point of view, general paralysis is an insignificant disease compared to phthisis, but its gradual increase in modern communities, its unerring deadliness, and its well-defined clinical symptoms invest it with a weird and fascinating interest. Moreover, the medical profession throughout the civilised world had, during the past quarter of a century, been educated into the firm belief that general paralysis and tabes dorsalis were post-syphilitic diseases, and it cannot be denied that a previous syphilitic infection can be traced in the cases of a preponderating number of the subjects of these diseases. Dr. Ford Robertson accepts this dictum, but contends that syphilis is but one—probably the most important—of the reducing affections which break down the immunity of the system and render it susceptible to the ravages of the Klebs-Löffler bacillus, which bacillus—if we understand him aright, and it must be confessed that on this essential point his voice is not so clear as could be desired—is the specific cause of the symptoms of general paralysis. That this bacillus—which he rather vaguely describes as "a diphtheroid bacillus, either an attenuated form of the Klebs-Löffler bacillus, or more probably an altogether distinct micro-organism—was found to be constantly present in the tissues, the fluids, and the excretions of a large proportion of the cases investigated has been shown beyond doubt. It has been demonstrated that its inoculation in the case of a limited number of the lower animals resulted in the production of paralytic symptoms. Lastly, evidence, though meagre in amount, has been adduced pointing to the presence of bacteriolytic anti-bodies in the blood of general paralytics, and showing that the active polymorpho-nuclear leucocytes of persons suffering from the disease have a greater power of dissolving the bacillus than that possessed by normal leucocytes. In all these directions a great deal of affirmative and conformative work remains to be done, if the great majority of critical onlookers are to be convinced that the rôle of the bacillus is a primary one, and that its presence is not the result of a late and terminal infection. We wish Dr. Ford Robertson every success in the onerous and obligatory investigations which still lie in front of him. He may rest assured of the goodwill of his professional brethren, but he need not be surprised if for the present they adopt the attitude of suspended judgment.

Medical Evidence in Court.

THE phrase that doctors differ is believed to apply with special aptitude to their appearance in courts of law, and in a trial in which medical questions are raised it is taken for granted that the more eminent the medical witnesses the more will they differ in matters of opinion. It is a matter of common knowledge that doctors as a class are unwilling to appear as witnesses in the Court of Session, and that this attitude is not based on any inadequacy of remuneration such as is made the subject of so much complaint in England.

Let us consider the facts of the case. A doctor in busy practice is summoned to attend the Court; he finds on arrival that several hours may elapse before he is called to give evidence. He has to hang about in a cheerless corridor, where there is neither rest for body nor repose for mind, and when his patience is well-nigh exhausted and his self-respect reduced to a minimum, he is suddenly ushered into the Court and formally sworn. His examination-in-chief is usually free from incident, except that, perhaps when he least expects it, the counsel pushes him farther than he had undertaken to testify, and, trusting to the yielding of the witness under the dramatic surroundings in which he is placed, expects him to concede this point or that, rather than diminish in any way the testimony he has already given. Upon this there follows the cross-examination; the witness, while enjoined to answer yes or no, is asked questions which do not always admit of such reply. The witness is not asked for his opinion as he is when consulted in a case of illness. A series of questions is propounded, often wide of the subject in hand, and having no apparent connection with each other, sometimes suggesting a doubt as to his honesty, his knowledge, and professional status; questions are put with the object of obtaining a yes or no which will, in the eyes of the jury, weaken or distort the evidence given in chief, and if at all possible, enable the counsel to "score" off the witness. In other words, it is not always essential facts and honest opinions which are brought before the jury, but such distortion of these as is possible by the tactics of the counsel upon an inexperienced and often nervous witness. Is it surprising that under these conditions the medical witnesses on the two sides should appear as opposed to each other, and as having given a bias or colour to their opinions which does not really exist; or that they do not regard a citation with feelings of unmixed satisfaction?

Sir John Batty Tuke, who so worthily represented St. Andrews and Edinburgh Universities in the last Parliament, has been re-elected by a considerable majority over his opponent, Mr. Strachey. The result of the election, which was contested rather on professional and personal than on political grounds, is most gratifying to the medical profession. The parliamentary experience and influence of Sir John Batty Tuke, together with his wide knowledge of medical questions likely to come before the House of Commons, render him an ideal representative of a constituency which embraces so many graduates in medicine.

We have to record the appointment of Dr. Harvey Littlejohn as Regius Professor of Forensic Medicine in the University of Edinburgh.

The annual meeting of the Edinburgh and allied Scottish Branches of the British Medical Association has become an event of considerable interest and importance, and that held on the 17th February attracted the usual number of practitioners from all parts of the country, ranging from Carlisle to Inverness. One of the most important features was a magnificent collection of pathological specimens, which served to show the wealth of material at the disposal of the Edinburgh Medical School, and the use that is made of it for teaching purposes. Cliniques and demonstrations were given throughout the day in different departments of the Royal Infirmary, and the customary dinner was held in the evening, under the presidency of Dr. Allan Jamieson.

The annual dinner of the Royal Medical Society was held in the Society's Hall on the 7th February. Dr. Graham, the Senior President, occupied the chair, and was supported by the guest of the evening, Professor Clifford Allbutt, the Lords Ardwall and Salvesen, the Presidents of the Royal Colleges, and many others.

We regret to announce the death of Allan Cuthbertson Sym, M.D., Edinburgh; Peter Burdon M'Nicol, M.D., Stirling; and Dr. George Lowson, Dundee.

ORIGINAL COMMUNICATIONS.

THE TREATMENT OF ECZEMA.[1]

By W. Allan Jamieson, M.D., F.R.C.P.Ed., *Lecturer on Diseases of the Skin, University of Edinburgh; Physician for Diseases of the Skin, Edinburgh Royal Infirmary.*

However interesting and engrossing the study of the varieties and the determination of the diagnosis of eczema may be; whatever opinion we may entertain as to the nature of the causes which lead to its production,—the practical issue how it is to be successfully treated is the most important from the physician's as from the patient's point of view. All who have devoted any attention to the matter are unanimous that no specific for eczema exists. There are physicians who look upon eczema as a mere synonym for gout, yet no amount of anti-arthritic remedies, whether these be the waters at mineral spas or the concoctions of the apothecary, will alone cure eczema. In saying this there is no intention to undervalue the undoubted benefits which arise from both these sources. Judging from the prescriptions shown by patients coming under my notice, it would appear that there are still many who hold the belief that arsenic is a power in this direction, and who order it almost as a routine method. My experience tells me that arsenic is of little or no use in the treatment of eczema. In acute cases it tends to aggravate; in chronic it rarely if ever benefits. So far as medicines are concerned, one ought to correct by their means any manifest error amenable to their influence, and to administer such drugs and in such a way as to obviate those errors so far as possible. Eczema occurs quite independently of either gout or rheumatism, and has no necessary connection with these diseases. Eczema in those of a gouty stock may manifest great intractability, and the regimen and the waters of some suitable spa may much accelerate the cure. Very much the same effect, however, is produced should our patient merely betake himself to the open country at some distance from the sea, and while there live a simple and regular open air life, rising early and retiring early to rest, and, above all, keeping his mind free from the worries and anxieties of business, as his environment removes him from the noise, the bustle, and the impure atmosphere of the city. The diet in eczema needs regulation, but this is more in the direction of being plain though varied, than in the institution of vexatious restrictions. An ordinary mixed dietary is the best, consisting of meat in reasonable quantity, alternating with fish or fowl, with full allowance of green vegetables and farinaceous articles cooked with milk. Dilute stimulants may be partaken of with meals, provided that their ingestion is found to promote appetite and favour digestion, but not otherwise. In women, tea is liable to retard the cure of eczema, no doubt because it is apt to be taken too strong, too hot, and too frequently, and so to set up gastritis, or at least to interfere with the proper action of the gastric secretions. Smoking also is prejudicial, yet if the patient is so far well as to be much out of doors, and especially if living in the country, it may be indulged in in moderation with no great harm.

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[1] A clinical lecture delivered to the University Class on 16th February 1906.

Dr. Arthur J. Hall's recent careful "Inquiry into the Ætiology of Infantile Eczema"[1] has elicited the fact that, in young children at least, the evidence is largely in favour of external irritation being the cause, though with decrease of temperature in the colder months of the year there is a corresponding rise in the number of fresh cases. The same applies, though perhaps not to the same degree, to eczema in adult life, external noxious agencies prepondering greatly over internal in evoking it. Hence in the treatment of eczema we must rely chiefly on external means. No one who has visited the continental hospitals, and has watched the remedial measures employed in cases of integumentary disorders, but comes away convinced of the value of local as compared with constitutional remedies in eczema.

Adopting this view, on what principles ought we to conduct the management of a case of eczema? There are three terms which must be constantly kept in mind in our dealings with it, which are our guide-posts on the way, and which must be passed warily. These are—(1) *Cleanse*; (2) *soothe*; (3) *cautiously stimulate.* None of these several procedures may be carried out with undue haste, and the effect of each must be watched and weighed before the next stage is entered on. There is an idea prevalent among the laity that were the vexatious itching which accompanies it neutralised, a cure would follow. A friend of mine afflicted with eczema told me that he once read an advertisement which appeared in the pages of some periodical, announcing a certain cure for eczema within the reach of anyone, and which would be imparted on receipt of the moderate sum of five shillings. He sent the money, and on opening the envelope containing the promised reply, found written "Don't Scratch." But the imperious necessity of doing something at all hazards to allay the pruritus, renders all such advice futile, and not till pain succeeds the sensation of titillation, and harm, which it may take days to recover from has been effected, does the sufferer abate from tearing at and rubbing the afflicted part. There are salves and lotions prominently brought under notice which are said to cause instant cessation of the itching, but while some do, in limited or moderate cases, relieve for a time, it has not been my experience that such ever cured. New remedies are continually being vaunted as panaceas for eczema; while a few have come to stay, the large majority vanish as suddenly and as mysteriously as they appeared.

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[1] *Brit. Journ. Dermat.*, London, 1905.

It is not my intention here to enter fully into the treatment of all forms of this protean disease, which attacks, under somewhat different fashion, every part of the body, but rather to select three prominent localities, and to sketch out in some detail the manipulations appropriate for each. It is better to learn a little well than to acquire a smattering of much.

A most common and well-defined form is that known as eczema rubrum of the leg. When this comes before us the disease is usually in a fairly active condition, for the individual attacked continues as a rule to go about as long as he can, pacifying his mind with the hope that one day he will find an improvement, and the member, by plastering it over with some recommended dressing, secured by a badly fitting bandage commencing above the ankle. The greater portion of the leg, from the knee downwards, is of a dull crimson-red, the hue concealed in many places by thick crusts, partially or wholly attached. The leg is swollen, stiff, hot, and uneasy, and the sensation experienced is one of burning rather than of itching. The skin is densely fixed to the underlying fascia. He walks with pain and difficulty. Here we must put in practice the first of our indications, we must cleanse while we coincidently fulfil the second, and at the same time soothe. If at all possible, he ought to be in bed and his leg to be unintermittingly enveloped in a soft amylaceous jelly, rendered blandly antiseptic by the addition of boric acid. We employ in fact a poultice of cold well-made starch, of a pultaceous consistence, spread out in a layer 1 in. thick, but separated from the skin by the intervention of a layer of muslin to facilitate removal, and not covered with any impervious material, such as guttapercha tissue or oiled silk, with a view of preventing the moisture reaching the bed-linen. This requires renewal about four times in the twenty-four hours, since it must never be allowed to become dry and hard, and at each time of changing, all crusts and accretions which can be detached without pain, are to be gently wiped away. Even in a couple of days the alteration for the better is remarkable. In five or six the surface is entirely clean, looks shining, red, exudes a clear serosity, and can now be pinched up as a thick rather slippery fold between the fingers, while the burning has subsided and itching is, for the moment, not annoying. We can now dispense with the poultice, which has accomplished all we contemplated, and persevere in our compliance with the second indication, to soothe. Almost invariably we will find this most perfectly satisfied by employing an ointment originally suggested by Kaposi as a substitute for Hebra's unguentum diachyli, namely, the unguentum vaselini plumbicum. This is made by melting and thoroughly incorporating equal parts of vaseline and emplastrum plumbi, the result being a tough ointment, which can readily be spread thickly on strips of linen or lint, adapted closely to the limb, and secured there by an expertly applied cheesecloth cotton bandage, commencing at the roots of the toes, carried twice round the foot, twice round the ankle as a figure of 8, and then up the leg with the necessary artistic turns, till fastened below the knee with a safety pin.

It may happen, however, that this method cannot be worked out in its entirety; our patient must perforce pursue his occupation, and is unable to spend nights and days in bed. Then we have to be content with poulticing at night, while the ointment is used during the day. Progress is slower, but there is progress. Whichever plan is adopted, in course of a week or two, the skin of the leg, while still vividly red, is seen to be covered with a film of tender but continuous new epidermis. Itching now probably is complained of, and is a constant accompaniment of the formation of young investing epithelium. When we are sure that the surface is entire, by testing it by pressure and slight friction with the finger, the period has probably arrived when we may try the third indication, to cautiously stimulate. There is an ointment devised by the late Mr. Startin, which, sagely wielded, can in many instances be relied on to complete the cure. This is composed of 10 grs. each of ammoniated mercury and black sulphide of mercury, $\frac{1}{2}$ drm. of precipitated sulphur, 4 grs. of camphor, and 1 oz. of vaseline. There is a slight alteration made by me from the original formula in substituting vaseline for lard, which is prone to decompose. This is well rubbed in night and morning to all the still reddened surface, and the limb bandaged. Though the camphor in the salve acts as an antipruritic, the itching may be troublesome. Bathing the limb at night with water as hot as can be safely borne, checks it for a time, and strict injunctions are to be given on no account to yield to the temptation to rub or scratch. If this is obeyed, a complete and permanent cure is the result.

Another situation where we encounter eczema of an obstinate type is on the scalp. The whole or the greater part is found on examination to be covered with thick, adherent, yellowish crusts, beneath which, or visible where they have been displaced, the skin is reddened, tense, and immobile, often the hair is considerably thinned, and is dry and staring. The lymphatic glands in the neck are swollen. This variety may occur at any age, but is most frequent in young adolescents or young adults. The characters are in many instances those which Unna has brought into prominence under the designation of seborrhœic dermatitis, and there may be elicited a history of pre-existing dandruff, though this is not invariable. The sufferers, occasionally at least, exhibit features associated with struma, and when so there is apt to be annoying recurrence after apparent cure. There are two ways of dealing with the condition. If the patient is well advised and will submit to it, the most satisfactory plan is to have all the hair removed, cut short at first, then closely shaved at a later period, when all the crusts have been banished. An attack on the disease must be made in the first instance by applying the starch poultices exactly in the same way as on the leg. Here, too, the immediate result is remarkable. The scalp soon becomes red, smooth, glossy, and devoid of a nauseous odour which arose from it, while its mobility is restored. The skin of the scalp is more resistent than that of the leg, and will bear with advantage a daily cleansing with fluid potash soap and warm water. The soap should be poured on to a piece of wet flannel, and the shampoo effected with its aid. When all the crusts have been cleared away, and the scalp can be freely moved, we may at once proceed to measures inapplicable in the case of the leg. The daily washing is continued, using the same variety of soap, and, after drying, an ointment consisting of salicylic acid 10 grs., precipitated sulphur 15 grs., camphor 4 grs., and vaseline 1 oz., is well but gently rubbed in. The inunction without the previous washing should be repeated a second time in the twenty-four hours. Steady and uninterrupted improvement is the rule, but several weeks must elapse ere the case can be pronounced well. Almost always the hair grows in as thickly, or even more so than before. As a prophylactic against return, care is to be taken to wash the head at short intervals with the soap mentioned, and to employ a pomade of resorcin 10 grs., or sometimes with an equal part of sulphur in addition made up with vaseline, or vaseline with a little lanoline. Should the patient refuse to permit the removal of the hair, an attempt may be made to cure by softening the crusts with almond oil and washing with the same soap, continuing this till quite clean, and then following the subsequent method described above. This is, however, much inferior both in rapidity and ultimate success.

A third form of eczema which may usefully be employed in illustration is that troublesome and obstinate variety which attacks the palms, no other region being necessarily involved. In this type there may lurk a gouty taint, but this cannot always or even frequently be satisfactorily traced. While both palms are, as a rule, affected, one is generally more severely implicated than the other. We find a dry, rough, cracked layer of imperfectly developed epidermis replacing the normal skin of more or less of the surface. The hand can hardly be fully extended; it may be hot to feel, or be the seat of burning sensations, while fissures, both deep and painful, are manifest in the lines of flexion. Progress has been gradual and eccentric. The construction of the integument in this situation differs from that of either of the previous regions. The skin is dense and firm, only slightly movable on the deeper parts, and its lubrication is provided by sweat alone, not by sebum and sweat in conjunction. To cure it, we must work our way down to a sound level, and this can only be accomplished by carefully and leisurely removing the unhealthy formation. The starch poultice is here again our sheet-anchor. There are other methods which may be employed as substitutes, such as a soft magma of emol-keleet and water, spread thickly on lint, and prevented from drying by enveloping the hand so covered with guttapercha tissue; occasionally, that form of salicylic plaster made by Beiersdorf of Hamburg, and called by Unna, its discoverer, salicylic acid tricoplast. This is a pliant plaster, the ingredients composing which are spread on a soft muslin, which adheres well and accommodates itself perfectly to the inequalities of the surface. By wearing strips of this for ten days, renewing them daily or every second day, we can reach a solid smooth surface. But, on the whole, the boric starch poultice is the handiest and the most successful. The application of these must be continuously persevered in till the hand can be freely and readily flexed and extended, till all trace of fissures has disappeared, and all crusts or scales have been dislodged by friction with a rough piece of cloth each time the poultices are changed. The palm now has a soddened, soft appearance, and no longer burns. We next have recourse to the unguentum vaselini plumbicum on linen, as in the case of the leg, but to maintain it in absolute contact with the palm it is usually necessary to place a mass of cotton-wool over the linen, and bandage with a narrow bandage. This soothing and astringent salve requires to be continued for at least a couple of weeks ere the new epidermis will bear stimulation. The skin when freed from the ointment looks red or pink, shiny and smooth, but still tender. We may now try a special combination, which consists of oxidised pyrogallic acid 10 grs., salicylic acid 10 grs., lanoline 1 drm., and vaseline 7 drms. This should be well rubbed in though in small quantity, and gloves worn. The application may be repeated night and morning. The progress towards cure is shown by the aspect of the palm after applying the ointment. At first this blackens the entire surface, but as healing advances only the still diseased portions become discoloured, till finally only the places where the fissures were still show up as dark lines, the localities where the ailment had gone deepest. While the ointment is being used, washing must not be frequent, and rather with oatmeal and water than with soap of any kind. When it is decided to discontinue the ointment, the hands should be dusted with a powder made of salicylic acid three parts and talc ninety-seven, several times a day, always after each ablution.

The methods formulated illustrate the general principles on which eczema should be treated, but there are individual peculiarities in management demanded by locality and idiosyncrasy. Into these there is not time to enter; and for the rules to guide one, reference ought to be made to such works as

"Eczema and its Management,"[1] by Bulkley. Still there are a few cautions which may, perhaps, be given before concluding.

One is that the unguentum zinci, B.P., is a very unsafe remedy to employ unless with special precautions. This ointment, to be used without risk of harm,—and the remark applies to all ointments,—must be freshly prepared. It is, however, apt to be made up in bulk and kept indefinitely, so that what is handed to the patient may have been compounded weeks, nay, possibly, months before. The benzoic acid combined with the lard is relied on to keep it from rancidity. This it cannot do, and, besides, it is itself an irritant. Hence we often find eczemas get steadily worse under zinc ointment. If a simple zinc ointment is desiderated, that made up with cold cream is the best. Unfortunately, cold cream has no certain composition. The following will be found to answer every indication:—Lanoline and white wax, each ½ drm.; almond oil and distilled water, each ½ oz. With this, zinc oxide, or bismuth oxide, or prepared chalk may be incorporated in suitable proportions.

Again, in France and Austria, tar is much prized in the treatment of eczema, and is largely prescribed. It is undoubtedly a valuable remedy, but one not always well borne by British skins. The mildest kind of tar is coal tar, and the safest way to use it is dissolved in acetone. ℞ Picis carbonis, 5–10; benzol, 20; acetone, 80. The solution must be filtered before being used. This belongs to the stimulant class, and in cases where recovery is incomplete, a thin layer may be painted on once a day or once in two days. If it suits, it succeeds brilliantly, but it does not invariably agree.

Ichthyol has acquired a great reputation with the mass of the profession, but is apt to be prescribed too strong. One or 2 per cent. in cold cream or Lassar's paste is sufficient. Beiersdorf's precious zinc ichthyol salve muslin owes part of its efficacy to ichthyol. Its expensiveness is its only drawback.

When eczema is dry,—the erythematous or papular forms,—lotions often suit well. The familiar calamine lotion needs no recommendation. Should itching be very annoying, one suggested by Boeck of Christiania has proved most effectual. It consists of talc, powdered starch, dilute solution of subacetate of lead, a 1 per cent. watery solution of boric acid, each 100 parts, glycerine 40 parts, camphor water 200 to 300 parts. This, which belongs to the soothing class, cools pleasantly, gives much comfort, and may alone cure, if used in the varieties mentioned, but it is wholly unsuitable for any kind of moist eczema.

In treating eczema, familiarise yourselves with the action of a few substances, and only gradually extend your repertoire. In this way you will make the fewest mistakes, and obtain the largest percentage of cures.

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[1] G. P. Putnam's Sons, New York and London. 1901.

ON THE TREATMENT OF FRACTURED PATELLA BY TRANSVERSE WIRING (WITH A SYNOPSIS OF SIXTEEN CASES).[1]

By GEORGE G. HAMILTON, M.B., F.R.C.S., *Surgeon to the Liverpool Royal Infirmary.*

(PLATES II.–IV.)

FOUR years ago, at a meeting of our Liverpool Medical Society, I spoke *against* the open method of wiring the patella, because at that time, considering the advantages and the risks, I did not think it was *justifiable* as a routine operation. With improved methods, I found I could open the knee joint for other conditions, without suppuration, and as on this the whole question of wiring turns, I now believe that the open method quickly performed is the best, at any rate for the working man.

The first surgeon, probably, to wire the patella was Burton of Philadelphia, and shortly after, Cooper of San Francisco, in 1861. I saw Lord Lister wire his first case in 1877. But even in his hands there was always a grave anxiety, and until recently most surgeons have been content with the results they have obtained by non-operative methods.

It will be profitable to look for one moment at the opinion of leading American, German, French, and English surgeons, expressed as recently as three years ago. Of seventy-one surgeons, chiefly American, replying to an inquiry by Dr. Powers, only *nine* practised the open method, and these included Kocher, Lister, Halsted, Horsley, and Phelps. *Forty-one* would operate on selected cases only, and *twenty-one* would not operate.

As representing the French School, Berger, as recently as May 1903, whilst holding that the open suture or encircling ligature remain the best methods, in the absence of decided contra-indications, points out that such treatment, especially when practised by inexperienced surgeons, is not free from complications so serious as to enforce the necessity of not neglecting the older and more simple methods. Results almost as good, he thinks, may be obtained with time and pains without resorting to the open method.

The remarks of Mikulicz in December 1902, made in London as a tribute to Lord Lister, pretty well represent the German practice. He relates forty-five cases in twelve years in his own practice, of which thirty were operated on, with suppuration in four cases. In eight out of twelve cases X-rayed, the picture showed incomplete restoration in the anatomical sense, although to the touch bony union seemed to exist.

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[1] Read before the Medico-Chirurgical Society of Edinburgh, December 6, 1905.

Bull said, "It is sufficient to know that death and disaster from amputation and suppuration and ankylosis have followed its performance in the hands of the many, and that we have no evidence that, when in the hands of the few it has proved safe, the ultimate results have been better than those by non-operative methods." With this last statement I in no way agree.

Dennis thinks that the future practice of the surgery of this and other countries will soon enable us to condemn it as an unsafe and unjustifiable procedure, or else it will be conceded as one of the grandest triumphs of our art.

Now these were the opinions of leading surgeons three years ago.

I know that at King's College, where Lister had shown the way, the open method has been a routine practice for many years, but not very long ago the professor of surgery there said to me, "It is a good operation, but there are very few surgeons I would allow to wire *my* patella."

There are those who argue that the ultimate results are as good with early movement and medico-massage, as by the open method, and certainly the reports of eleven cases by Zum Busch are remarkable. Following on the Dutch, or method of Tilanus, he allows his patients to get up and go about in a simple splint on the second day, trusting to fibrous union, and thus preventing the adhesions which of necessity follow the complete fixation of the knee joint. I do not believe that any results are as good as those obtained by the open method. You can never remove the effused blood, which is always present when the patella is broken, by any other operation. If there were no risk of suppuration, there is no doubt the open would become the recognised procedure. I hope to show that it is a fallacy to say that the results by medico-massage, etc., are as good. As medical referee, I see a fair number of cases which have been treated in the non-operative way, and I have had to report on several occasions that a man was quite unable to go up and down a ladder, or to do active work in a ship's hold, as long as eighteen months after his accident. As a rule, a working man is quite willing to take a little risk in order to get back quickly to his work, and prevent his home from being broken up. Now, what is this risk to-day? I do not think very great even in cases not very carefully selected. One of my cases was a brewer's drayman, and another was a man in bad condition from syphilitic paralysis, and yet no trouble resulted. If trouble did result, I should make a very early opening on each side of the patella, and drain the joint behind the wired bone. If suppuration is prevented from getting into the pouches of synovial membrane or among the ligaments, the danger is not great. A case of compound fractured patella which, on application at the out-patient room was found to be suppurating, was so treated by my assistant, Mr. Litler Jones, and admitted to the wards under my care and I watched the patient make a good recovery with a movable joint.

I have opened a great many knee joints for conditions other than fractured patellæ, and I have no longer that terrible dread which one used to have. It must be admitted that if you have one disaster even in a hundred cases, the advisability of your practising the open method should be considered.

A practitioner in my neighbourhood told me that in his practice a case occurred in which the patient not only nearly lost her life, but in which the knee joint became disorganised, necessitating amputation of the thigh, and subsequently her shoulder joint had to be excised for a suppurative arthritis.

Ninety-one different methods of bringing the fragments together have been described, but with the exception of those of Dr. Butcher of Liverpool, Mr. Mayo Robson and Mr. Ramsay of Bournemouth, all are applied in a vertical direction.

The following are the main features of the method adopted in fifteen out of the sixteen cases put before you to-night. It is not desirable to operate at once, as by waiting a few days, time is given to properly prepare the skin. I have described elsewhere the details of the preparation of the skin, etc., but I would say in passing that finding Kelly's method made my hands very rough and was very messy, I have used a turpentine mixture for the last two years with better results.

The formula is—Green soap 6 parts, glycerin 3 parts. Mix and boil, then add one third turpentine.

For very hairy or very dirty skins, "Haarof," which is a sulphide of barium, and is sold for removing hair and wool from the lower animals previous to inoculation, is of great use. It does not irritate, especially if it is mixed with a little oxide of zinc.

It removes the hard dead epithelium over the ligamentum patellæ much better than a razor will. I now use it for all operations, especially emergencies. After thorough cleansing with the turpentine mixture, the hands are sterilised in alcohol and iodide of mercury. Freshly boiled silk is used for ligatures. Nothing is handled by anyone except myself and *one* assistant, and both of us now use gloves, although for the first ten of the cases my assistant alone used them. I thought the drill might tear the gloves, but I find by holding it in a sterilised towel that such a result is prevented.

A flap is rapidly turned up, and it is not necessary or advisable to carry this above the middle of the upper fragment, thus avoiding any pouching of skin; the knife is then placed between the fragments so as to open the knee joint (Fig. 1).

A considerable quantity of old blood clot, which is always present, is removed with sterilised gauze. The fragments are freshened and trimmed with the knife only. Flushing of the joint has never been practised, and I think it almost reprehensible to waterlog the delicate vascular fringes with carbolic, perchloride, or other lotions.

The mechanical drill of Down is invaluable. It is used, with only a little freshening and adjusting of fragments, to go transversely and superficially through soft and hard structures, after which medium silver wire is placed by means of the cannula. It is not necessary to handle the fragments at all; they are simply steadied while the mechanical drill goes through. The whole operation, including the suturing of skin, takes about sixteen minutes.

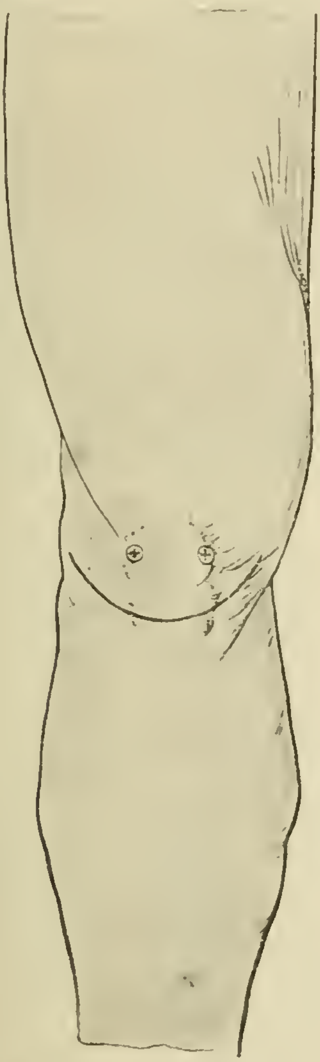


Fig. 1.—Shows best incision for avoiding pouching of the skin. The flap should not be carried above the middle of the upper fragment.

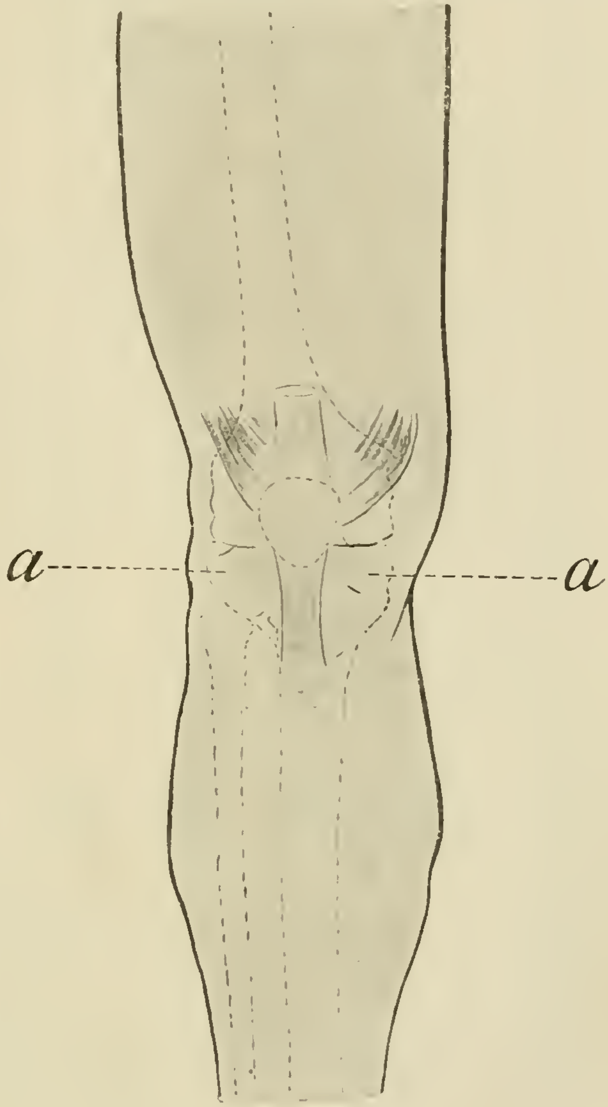


Fig. 2.—*aa*, Parapatellar ligaments attached to head of tibia and head of fibula, and which limit the lateral movements of the patella.

TABLE.—*Analysis of Sixteen Cases of Fractured Patella Wired by the Transverse Method.*

No.	Sex and Age.	Employment.	Date of Accident.	Accident.	Date of Operation.	Allowed to move Knee Joint.	Nature of Injury.	Progress after Operation.	Result.
1	M., 29.	Carter.	April 29, 1903.	Fell off a coal cart on to right knee. Knee joint much swollen and hot.	May 11, 1903.	May 19, 1903.	Transverse fracture.	Without suppuration.	X-rayed March 3, 1905, bony union, wire broken, been carrying heavy weights, bends to right angle.
2	M., 41.	Brewer's drayman.	Dec. 2, 1903.	Slipped in ball-room and fell in sitting position — felt his knee give.	Dec. 10, 1903.	Dec. 27, 1903.	Transverse fracture — a good deal of loose tissue between the fragments.	,, ,,	X-rayed March 1905, bony union, wire in position, bends to right angle.
3	M., 26.	Acrobat.	April 27, 1904.	Slipped, jumping — felt his knee strike ground, and give, while trying to save himself.	May 9, 1904.	May 28, 1904.	Transverse fracture—large piece of tissue covered with blood clots bulged into knee joint. Much organised blood.	,, ,,	Bony union, wire in position. Following employment as acrobat.
4	M., 24.	Carter.	Sept. 3, 1904.	Violent twist at football.	Sept. 12, 1904.	Sept. 30, 1904.	Transverse.	,, ,,	X-rayed March 1905, bony union, bends to right angle.
5	M., 15.	Plumber.	Sept. 17, 1904.	Fell off scaffolding on to both knees. Fractured both patellæ.	Sept. 26, 1904.	Oct. 24, 1904.	Right was in three pieces.	,, ,,	X-rayed February 1905, bony union. Follows usual employment.
6	M., 15.	Plumber.	Sept. 17, 1904.	,, ,,	Oct. 3, 1904.		Left—a piece of bone was turned into joint and had to be removed.	,, ,,	
7	M., 43.	Labourer.	Oct. 17, 1904.	Patient slipped, and in attempting to recover himself heard a "crack."	Oct. 24, 1904.	Nov. 6, 1904.	Right knee joint inflamed and tender and full of fluid. Transverse.	,, ,,	X-rayed March 1905, bony union, wire in its place, bends to right angle. Carries hods of bricks.

8	M., 28.	Ship's steward.	Oct. 23, 1904.	Fell and struck left knee against thick iron stanchion. Suffered from syphilitic paralysis.	Dec. 13, 1904.	Jan. 2, 1905.	Operation seven weeks after — firm adhesions between patella and end of femur.	,, ,,	Bony union, good useful limb, wire in position.
9	M., 35.	Carter.	Nov. 18, 1904.	Horse kicked him on left patella — compound (wound corresponded to back part of horse shoe).	Dec. 2. 1904.	Dec. 22, 1904.	Stellate (seven pieces), bradawl used through tendon of quadriceps and ligamentum patellæ, wire passed around fragments. Two silk sutures over top.	,, ,,	Bends to nearly right angle, bony union, wire seen surrounding patella.
10	F., 41.	House-wife.	Dec. 17, 1904.	Foot caught — fell down three stairs, and heard crack before her knee touched the ground.	Dec. 30, 1904.	Jan. 12, 1905.	Transverse. Much hæmorrhage into tissues. Organised blood in knee joint. Two silk sutures over top of patella.	,, ,,	Bony union, bends to nearly right angle, wire in position.
11	F., 23.	House-maid.	April 26, 1905.	Fell down the cellar steps.	May 1, 1905.	May 11, 1905.	Transverse fracture, two fragments.	First intention.	Bony union, moves to acute angle.
12	M., 23.	Farmer.	Aug. 20, 1905.	Fell from a loft, 10 feet high, on to his knee.	Sept. 5, 1905.	Sept. 15, 1905.	Three fragments, tarry blood in joint and small splinter of bone.	,, ,,	Bony union, moves to acute angle. Working as a carter on farm.
13	M., 49. (Mulcoy)	Painter.	Oct. 3, 1905.	Endeavouring to kick an offending dog, which he missed. Right patella.	Oct. 10, 1905.	Oct. 29, 1905.	Transverse fracture, three fragments, $\frac{1}{4}$-in. separation.	,, ,,	(Left was fractured nine years ago, not wired, wore a splint for many months). Says right is as good at one month as left at eighteen months.
14	M., 64.	Tobacconist.	Oct. 13, 1905.	Fell off tramcar on to his knee.	Oct. 24, 1905.	Nov. 4, 1905.	Transverse fracture, two fragments, $\frac{1}{2}$-in. separation.	,, ,,	(Bad vessels, wound healed up). Patient died of apoplexy.
15	M.	Coal carter.	Nov. 22, 1905.	Fell off cart.	Dec. 1, 1905.	Dec. 20, 1905.	Three fragments, eye-ball suppurating, operation postponed.	,, ,,	Bony union.
16	M.	Fire brigade officer.	Dec. 2, 1905.	Motor fire engine ran into wall while he sat on it.	Dec. 2, 1905.	Dec. 14, 1905.	Compound, many fragments.	,, ,,	Superficial stitch trouble, probably auto-infection.

In one case only has the silver wire sprung, and this patient has bony union, and last week was engaged all day carrying 1 cwt. of coal on his back up seventy steps.

The advantages of the transverse method are that, when the wire is twisted it acts like a *splint* to the fragments, and compresses them very tightly, thus preventing any oozing of blood into the joint. It can be inserted quite superficially, and although there has been no necessity in this series of cases to do so, it could easily be removed by making a one-inch incision over each end of the wire. Finally, no trouble is caused from it in kneeling.

Catgut, silk, kangaroo and reindeer tendon have not been found satisfactory in the hands of various surgeons. Medium silver wire has been used throughout in my series of cases, a couple of silk sutures bringing the parapatellar ligamentous tissue over the front of the united fragments (Fig. 2).

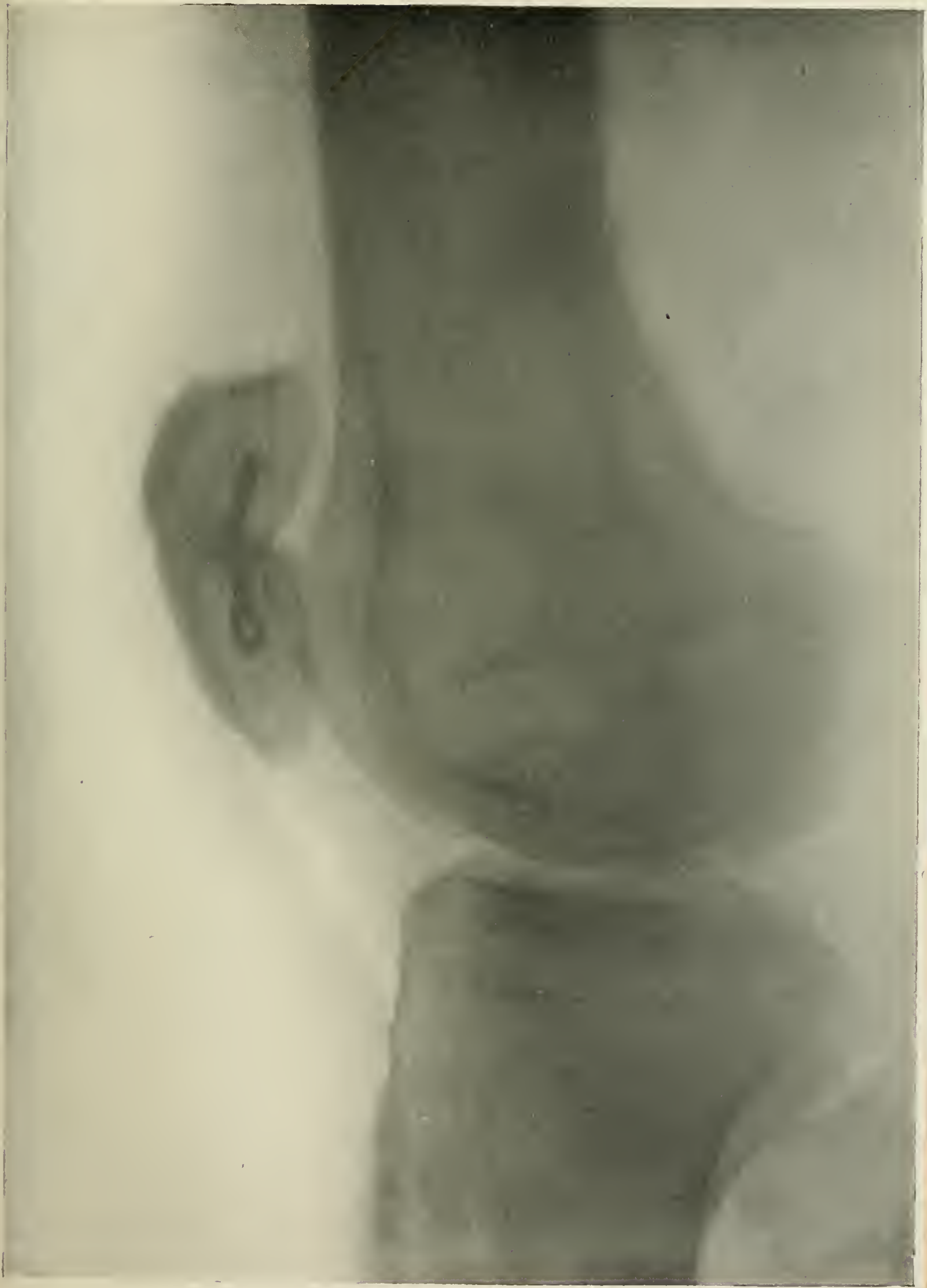
In one case, out of the fifteen mentioned, the patella was in seven pieces, and an encircling wire had to be used.

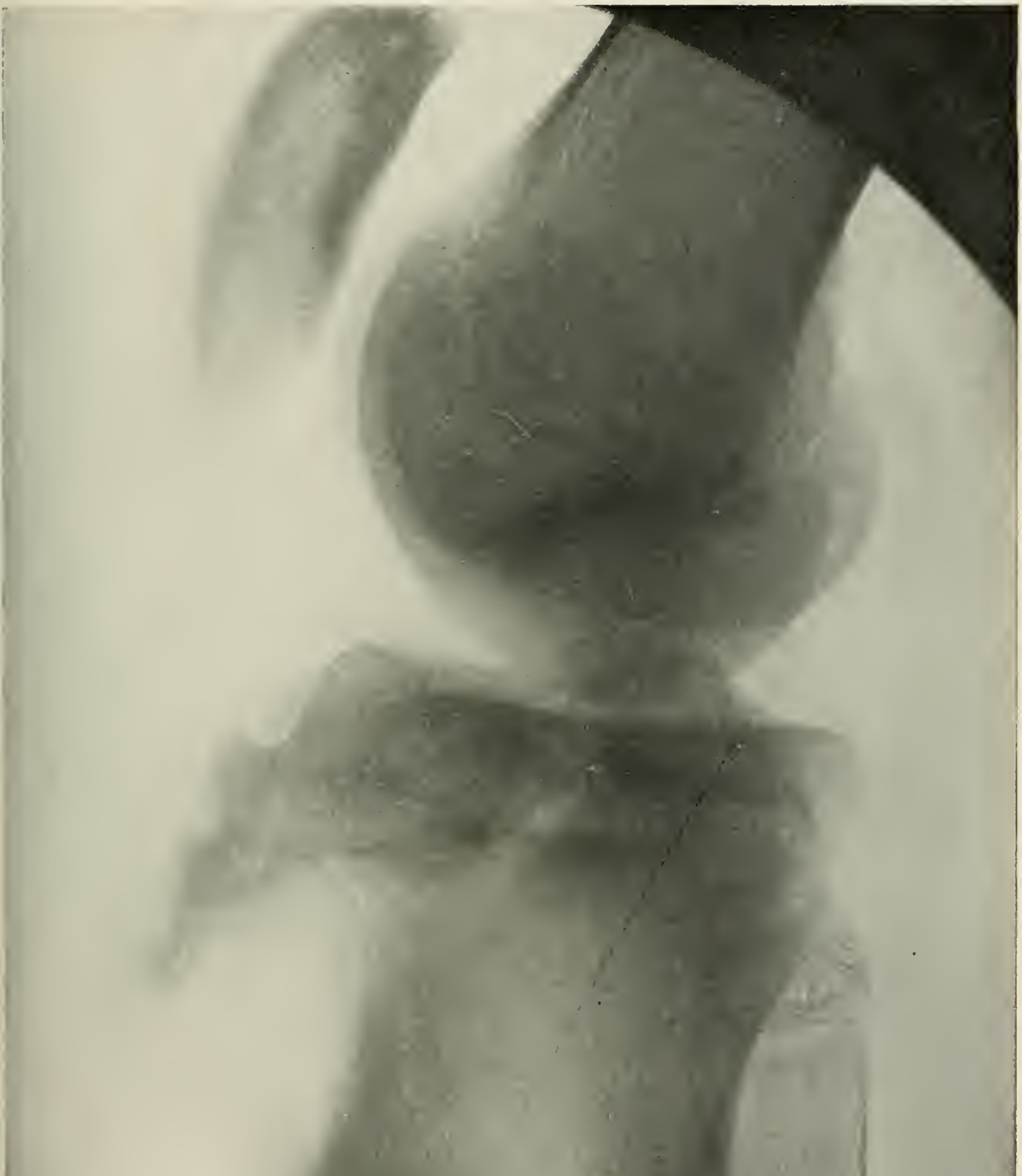
The analysis of the cases speaks for itself. The charts show that after the first day the temperature has been uniformly normal. There has not been a single case of sepsis, and in one case only was there a little trouble around one stitch, not sufficient to give a rise of temperature, and due, I think, to the fact that the man had varicose eczema of the limb below and eczema of the scrotum and upper part of the thigh.

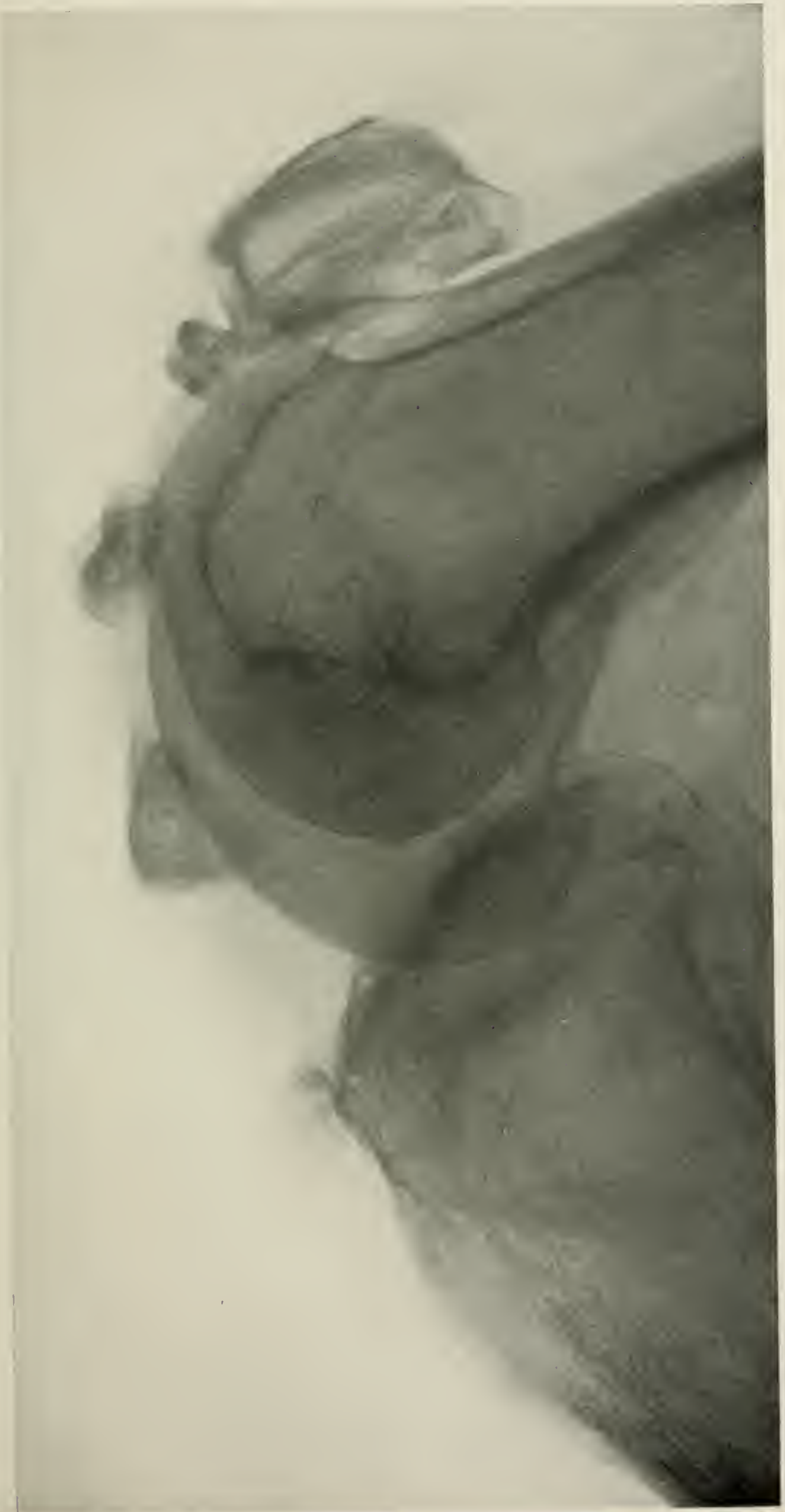
I have brought with me two patients—one a lad who has had both patellæ wired, and who runs along the roof-tops, in following his employment as a plumber; the other a man who nine years ago had one patella treated by plaster, and who wore a Thomas' splint afterwards for eighteen months. He was supposed to have bony union, but you will notice that there is now three-quarters of an inch of separation between the fragments. His other patella I wired recently, and he tells me that he could do more with the wired one in a month than he could with the unwired one in eighteen months. The time in hospital need not be so long as is shown in my earlier cases, and I now take off the MacIntyre splint in ten days, allow them out of bed in a fortnight, and encourage them to move the knee, which they do to a right angle, in another fortnight.

I have had a number of old *un*wired fractured patellas X-rayed, and hope to show you what an enormous amount of separation takes place in some cases years after the patient has been lost sight of, even although a splint has been worn for many months.

This is a detailed account of my work on this subject during the last two and a half years, and if I have appeared to dogmatise in the presence of some of my old teachers, I hope they will understand that it is because I am convinced that this operation can







now be done with safety, and that any success I have attained has been in great measure due to the early training which I received at their hands.

DESCRIPTION OF PLATES II.-IV.

Plate II.—Wiring by transverse method ; shows neat way in which wires lie.

Plate III.—Injury to an 18-year-old acrobat's knee, mistaken by medical man for fractured patella. Joint full of blood at once shows how tubercle and upper epiphysis are developed from same centre.

Plate IV.—The condition often found where the patella has not been wired. This man wore a splint for six months after leaving hospital (accident fifteen years ago).

SOME POINTS IN CONNECTION WITH THE MORE SEVERE SKIN ERUPTIONS PRODUCED BY THE BROMIDES AND IODIDES.

By Arthur Hall, M.A., M.D., F.R.C.P., *Physician, Sheffield Royal Hospital; Consulting Physician, Mexbro Montague Hospital; Lecturer on Clinical Medicine, University of Sheffield.*

(Plate V.)

There are many varieties of cutaneous eruptions produced by the bromides and iodides when taken internally. An erythema, a purpura, a simple acne, a bullous eruption, a so-called "anthracoid acne," or tuberous eruption, are the better known types, but are by no means all that occur. Whether they are all produced in a similar manner, and only varied in degree, is a matter of uncertainty. The erythema which follows immediately upon the first dose of iodide of potassium, however small, seems to me a different type of affection to those which only occur after varying quantities of the drug have been stored in the system. And I would here remark that whilst using the term acne in relation to these eruptions, it is a misleading one, for it suggests a relationship with acne vulgaris which probably does not exist at all. Unna's term of iodo-derma with a corresponding adjective "erythematosum," "purpuricum," "pustulosum," "tuberosum," is preferable.

As these eruptions vary in character, so also they vary in severity, the milder forms being on the whole the more common ; the severer, happily, rare.

The more severe cases, due to iodides, usually occur in persons suffering from diseases of the kidney either alone and primary, or secondary to or complicated by heart disease. In such persons a defective power of elimination is a probable predisposing cause.

In the case of bromides, one sees the more severe types of eruption chiefly in young children or infants, whose eliminative powers are not manifestly diminished.

This difference is probably more or less accidental. Were iodides administered freely to infants, or bromides, as routine treatment, to adults suffering from kidney diseases, it is probable that the above distinctions would be unnecessary.

Two points are worth remembering in connection with the more severe bromide and iodide rashes. In the first place, they may follow extremely small doses of the drug, administered for extremely brief periods; and, secondly, they continue to develop and get worse after the drug has been entirely omitted. They then remain severe for some time, and very slowly disappear. To illustrate these points I quote the following cases:—

Case 1.—In 1898 I was asked by a medical man to see a case with him of very severe anthracoid acne in a young woman, the subject of subacute nephritis. She had been progressing satisfactorily until 8th May, when she was given a 3-gr. dose of iodide of potassium. This was repeated three times during the next twenty-four hours, so that she took altogether 12 grs. of the drug. On 10th May a rash appeared on the face, as a papule on the right lower eyelid. This gradually enlarged, and more similar papules appeared on other parts of the face. I saw her first on 13th May, when her condition was as follows:—Under each eye there is a semicircular, papillomatous, tuberose swelling completely filling the lower-lid pocket. These are extremely tender and painful; very vascular and covered with a kind of crust. On removing a portion of crust, there is profuse bleeding of what appear to be elongated papillæ. Similar tense rounded tuberous swellings are situated here and there on the nose and cheeks. On the right side of the tongue at its edge there is a pointed oval projection, about the size of half an almond. It is extremely painful, and causes the tongue to be projected to the left. It is smooth and tense, and looks like a small tongue growing out of the large one. This occurrence of a lesion on the tongue, similar to those on the face, has, so far as I am aware, not been previously observed. In one case recorded by Morrow,[1] the tongue and fauces were extremely congested. On 18th May the patient's condition was very distressing, the repeated severe bleeding, whenever the spots were dressed, and the pain and discomfort of them were very great. On 28th May pericarditis developed, and she died a few days later. One could not help feeling that her end had been accelerated by the presence of this iodo-derma, for until that appeared she had been doing well.

Case 2.—The patient, a middle-aged man, was admitted into the Sheffield Royal Hospital under my colleague, Dr. Duncan Burgess, to whom I am indebted for permission to publish the case. He was suffering from aortic regurgitation, and had albuminuria. On 11th November, whilst in hospital, he was put on to a medicine containing 5 grs. of iodide of potassium. He had two doses on that day. The next day a slight eruption was noticed on his face, but nothing was thought of it. He consequently continued his medicine that day, taking three more 5-gr. doses. As the rash became more definite, the iodide was stopped, after he had taken a total quantity of 25 grs. of the salt. I was asked to see him on the 13th, when he exhibited a very severe vesiculo-bullous iodide eruption over the face, neck, ears, and backs of the hands. It was very painful, the vesicles and bullæ being extremely tense, with bright red areolæ, and a tendency to group and run together in a somewhat "herpetic" manner. On the 14th it was still more fully developed and extensive; on the 15th many of the blebs had burst and were oozing; on the 16th they were becoming distinctly opaque, the opacity in many being punctiform, and seen as yellow points through the walls of the vesicles. On the 17th, that is five days after the iodide was stopped, they were evidently less tense and many were scabbing over. (Unfortunately the photographs, Plate V., Figs. 1 and 2, were not taken till this day.)

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[1] "Selected Monographs on Dermatology," *New Sydenham Soc. Trans.*, p. 490.

This case I shall refer to again later.

Case 3.—In 1904 I was asked to see the young daughter of a medical man on account of an eruption on the legs. This proved to be a bullous bromide eruption, the drug having been given fairly freely for whooping-cough. The cause was suspected when the rash first appeared, and the drug at once stopped. New spots, however, continued to appear at intervals, for many days, and the old ones got worse in spite of the drug being stopped, so that it began to be doubted whether this really could be a bromide eruption after all.

Case 4.—An infant was brought to my skin clinic, at the Sheffield Royal Hospital, with a typical anthracoid acne, occupying the usual positions—face, forearms, and legs. It was at its full height of severity *exactly one month after the last dose of soothing mixture had been given.* This patent soothing mixture, called "gripe water," contained small doses of bromide, and had been given almost daily for some weeks previously. The rash gradually subsided, but was well marked for at least three months after the "gripe water" had been entirely left off.

These cases sufficiently illustrate the two points I have laid stress upon above, and I wish to emphasise them, because unless they are remembered it is so easy to be led astray and to miss the connection between the eruption and its cause.

When either a mother, in all innocence, or a medical man, with due carefulness, has unhappily set going one of these unfortunate eruptions, her or his position is an unenviable one, on account of the severity of it and the prolonged discomfort and disfigurement which it produces. Once the eruption has begun, it is too late to merely leave off the drug, and it only remains for the doctor to try and minimise the trouble which has been unnecessarily caused. The question is, how can that best be done?

In order to study that question, I would call your attention to certain features of Case 2, as illustrated by Plate V., Figs. 1 and 2.

This patient's rash appeared on 11th November, whilst lying in bed, partly propped up in the usual cardiac position. His bed was on the east side of a ward running due north and south. During the afternoon the low November sun poured in through the west windows straight on to his face, and it happened that at that particular time there was a series of sunny afternoons. The eruption appeared to cover irregularly the whole of his face, but on pushing back his hair, which he always wore brushed down over the forehead (Plate V., Fig. 1), it is seen that such is not the case. The skin of the forehead, above the level over which the hair came, is quite free from spots.

Similarly, in Fig. 2 it will be noticed that there is not a spot below the level of his night-gown neck. The same absence of spots above the wrist-bands was noted. In Fig. 2 it is also notable that the only spots seen on the scalp were situated near to the neck where the hair was cropped extremely short. There were no spots on the covered parts of the trunk or limbs.

This limitation of spots to certain exposed areas of the body in a case of severe iodide eruption, suggests that the exposure has played some part in its production. An exposed part of the skin is subject to two distinct possible sources of irritation—change of temperature, and the action of light. In the present case, the former of these must have been, at the most, but slight, as the patient was in bed in a ward of fairly constant temperature during the whole duration of the eruption. I think, under these circumstances, it is fair to consider that any change of temperature may be neglected as a source of irritation. On the other hand, he was exposed to sunlight in a very marked manner, as I have mentioned above. It may be said in reply that these severe iodide eruptions do particularly affect certain regions in cases where no excessive exposure to sunlight occurs. That is perfectly true, and one realises that there are certain parts of the skin which seem to be particularly prone to a deposition of the iodide salts as compared to others. Possibly this may have something to do with their vascular or glandular structure. But such a difference can hardly be supposed to exist between the two portions of skin on the forehead above and below the line on Fig. 1. Here the tissues are practically identical in structure, vascularity, and relations to underlying structures. As this line does correspond exactly to the line above which the hair must have protected the skin from the light, it certainly seems as though in this case light rays had played a part in developing the eruption. This is further supported by the distribution of the rash on other parts.

The exact pathogeny of these eruptions requires further investigation, but, as Unna points out,[1] the old idea that they are produced by the irritating effects of iodine compounds deposited in the sebaceous follicles is quite untenable. No such eruption is

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[1] "Histopathology of Diseases of the Skin," translation by Norman Walker, p. 104.

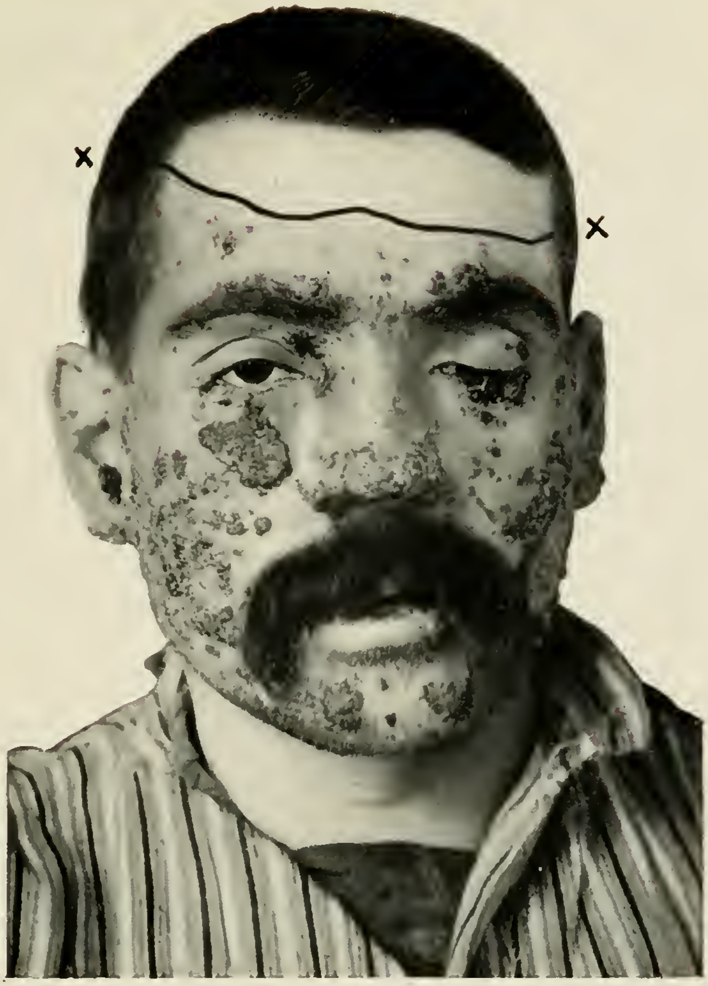

Fig. 1.

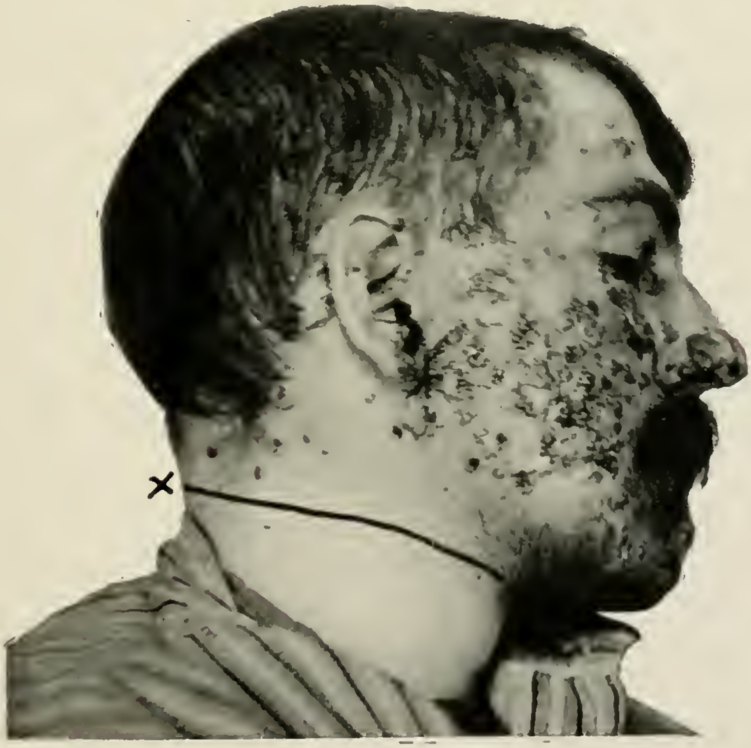

Fig. 2.

ever produced by painting the skin with tincture of iodine or by rubbing in iodide of potassium ointment, although in either case iodine must reach the sebaceous follicle without difficulty. Besides which Duckworth[1] has reported the presence of lesions in scar tissue where sebaceous glands did not exist. My case (No. 2), reported above, in which one of the tuberous swellings was situated on the side of the tongue, proves conclusively that sebaceous follicles are not necessary as a starting-point of the eruption. The general results of recent histological examinations point to the changes as being primarily in the blood vessels (Duckworth and Harris,[2] C. Fox and Gibbes[3]). These are found dilated and surrounded by sheaths of leucocytes. A local area of inflammation is formed in the cutis, which ends in cutaneous abscesses. If the follicles are involved at all, it is secondarily only. Unna[4] refers to the skin in this state of iodo-dermatosis, as being readily disposed to infection from without—in other words, it is a skin of diminished resistance to parasitic invasion. If that is so, it will probably be a skin of diminished resistance to other irritants. Mechanical irritation is a considerable aid to parasitic micro-organisms in their action upon the skin. Take, for example, the case of infected follicles of the neck, either front or back, and note the row of new pustules which follow the chafing of a high collar. In such a case there are three factors at work—a diminished resistance of the soil, micro-organisms, mechanical irritation. It may be, similarly, that in my case of iodide eruption the three factors were diminished resistance of soil, or increased susceptibility of the skin from the presence of iodide compounds, parasitic micro-organisms of the skin, and the chemical irritation produced by light rays.

In the case of severe bromide eruption, the connection between light rays and the eruption is not evident, for the arms and legs are fairly constant sites, at any rate in children; and though the face is affected in most cases, it is not predominantly so.

When such a severe halogen salt eruption appears, the mischief, as I have said above, is done, and it remains for us to minimise its effects as much as possible. This can only be done by protecting the skin from all sources of irritation. One of these, at any rate in the cases due to iodides, is light.

Possibly other irritants, mechanical or thermal or chemical, also play their parts. When such a case is seen at its commencement, I would suggest that the patient be kept in a darkened room, or, if desirable, have a red mask over the face, and that the legs and arms should be smeared over with a simple antiseptic powder or an antiseptic calamine paste, and wrapped up in cotton-wool to prevent any chafing, and the patient kept as quiet as possible. Meanwhile general treatment to aid elimination should be adopted.

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[1] *Trans. Clin. Soc. London*, vol. xii.

[2] *Trans. Path. Soc. London*, 1879.

[3] *Brit. Med. Journ.*, London, 1885, vol. ii. p. 971.

[4] "Histopathology of Diseases of the Skin," translation by Norman Walker, p. 101.

Unfortunately, it does not often fall to my lot to see a case at its inception, and I have therefore had no opportunity as yet to put my theories to the test, but I think such a course of treatment is worthy of trial by any one having such an opportunity. At least it has the advantage of simplicity and of harmlessness, and if any one has once suffered the extreme annoyance of producing one of these eruptions, he will, I am sure, welcome the opportunity of doing anything to prevent its development.

In conclusion, I would remind my readers of the risk of giving iodide in any form, or any dose to patients with diseased kidneys, or of giving bromide, in however small doses, to infants for long periods.

THE PATHOLOGY OF GENERAL PARALYSIS OF THE INSANE.[1]

By W. Ford Robertson, M.D., *Pathologist to the Scottish Asylums.*

Statistics seem to indicate that general paralysis of the insane has been increasing during recent years. The etiology and pathogenesis of the disease, notwithstanding many positive and dogmatic assertions that have been made regarding them, have hitherto remained a profound mystery. In the recent literature of the subject there can be recognised a growing dissatisfaction with the syphilitic hypothesis. The pathological alterations known to occur in the nervous system consist chiefly in acute and chronic degenerative changes in the cortical nerve cells; degeneration of the medullated fibres of the brain, especially in the first layer of the cortex; hypertrophy and proliferation of the neuroglia in the cortex and elsewhere; formation of granulations of the ependyma; proliferative changes in the walls of the cerebral vessels, generally accompanied by the development of plasma cells; thickening of the pia-arachnoid, in consequence of chronic proliferative changes in its tissues; the appearance of large numbers of lymphocytes in the cerebro-spinal fluid, and early tabetic lesions in the spinal cord. During the last six years a series of researches have been carried out in the Laboratory of the Scottish Asylums, with the object of elucidating the essential pathology of the disease. Dr. L. C. Bruce has also made independent clinical investigations of a similar nature. In 1901, Dr. Bruce recorded the results of continuous observations made upon the temperature and leucocytosis in individual cases. He showed that febrile attacks generally occur every two or three weeks, and that these attacks are accompanied by leucocytosis, and that in the third stage leucocytosis may occur from time to time without rise of temperature. He concluded from his observations that general paralysis is a disease directly due to poisoning by the toxins of bacteria, whose point of attack is through the gastric and intestinal mucous membranes. In a paper published at the same time, the writer maintained similar views, on the ground of the results of an examination of the pathological changes in the alimentary tract in a series of cases. Further evidence of chronic toxæmia was found by Dr. A. C. Ainslie in the constant occurrence of widespread and often well-marked chronic endarteritis of the extra-cerebral vessels, even in cases in which senile changes could be excluded. In 1902, Dr. G. Douglas M'Rae, Dr. Jeffrey, and the writer commenced a bacteriological investigation. It was found that a diphtheroid bacillus was specially prominent in the gastro-intestinal and respiratory tracts in cases of general paralysis, and that a similar organism could frequently be isolated from the brain. The hypothesis was advanced that general paralysis is the result of a chronic toxic infection from the respiratory and alimentary tracts, permitted by general and local impairment of the defences against bacteria, and dependent upon the excessive development of various bacterial forms, but especially upon the abundant growth of a Klebs-Löffler bacillus of modified virulence, which gives the disease its special paralytic character. Dr. M'Rae and the writer have since been continuing these bacteriological investigations, and every step forward has resulted in the elucidation of some fact that has made this diphtheroid hypothesis more probable. Histological investigations have yielded much confirmatory evidence. Dr. Shennan and the writer have made a short series of experimental investigations with diphtheroid bacilli isolated from cases of general paralysis. The organisms have proved non-virulent to guinea-pigs. Rats fed upon bread mixed with unsterilised broth cultures developed nervous symptoms, and died in about ten weeks. These animals presented evidence of the occurrence of many of the morbid processes that can be recognised in the nervous system of the general paralytic, but they survived too short a time to make it possible for the complete histological picture to be developed. In three of the animals there was a widespread invasion of the tissues by the bacillus in a filamentous form, which has also been found invading the tissues in several cases of general paralysis. Dr. L. C. Bruce has made a similar observation upon a goat, which he injected with cultures derived from the same source as those used in the experiments upon the rats. The goat became paretic, and died in a condition resembling a "congestive attack." Its brain showed changes resembling those in an early case of general paralysis. In May of last year, Dr. M'Rae and the writer recorded that they had found that diphtheroid bacilli are constantly present, often in very great numbers, in the genital tract in both male and female paralytics. Further, in seven consecutive cases of general paralysis combined with tabes, the urine has been found to be loaded with diphtheroid bacilli. It was also ascertained that bacilli having little affinity for staining reagents, but having a distinct resemblance to diphtheroid bacilli, could be observed in the blood during congestive attacks, in the centrifuge deposit from the cerebro-spinal fluid removed by lumbar puncture, and in the urine. These and other similar observations raised the question whether diphtheroid bacilli are not from time to time gaining access to the blood, and being rapidly destroyed by phagocytic and lysogenic actions. In order to gain light upon this question, Dr. M'Rae and the writer have investigated experimentally the action of the living blood upon pure cultures of diphtheroid bacilli isolated from cases of general paralysis. It has been ascertained that the bacilli are taken up by leucocytes with great rapidity, and that they may be completely dissolved in the interior of the leucocytes within two or three hours. An endeavour has been made to estimate exactly the power of the leucocytes of different individuals to dissolve these bacilli, and it has been found that this power is distinctly greater on the part of the leucocytes of the general paralytic than on that of the leucocytes of controls. The appearances of the dissolving bacilli in the experimental films are identical with those presented by the imperfectly staining micro-organisms that can be seen in various situations in the general paralytic. The results of this experimental study suggested that failure of previous attempts to obtain cultures from the blood and cerebro-spinal fluid is dependent upon the fact that most of the bacilli are dead, and that the few living ones that are occasionally present are quickly killed by the continued action of the phagocytic cells. An endeavour was therefore made to obtain growths by leaving the tubes in the cold for twenty-four hours, and then incubating them. This plan has proved successful with the blood from four cases, and with the centrifuge deposit from the cerebro-spinal fluid in two. In all of these cases pure growths of a diphtheroid bacillus were obtained. The growths are at first generally extremely feeble. A feeble culture may be invigorated by sub-culturing upon blood films.

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[1] An abstract of the Morison Lectures for 1906, delivered before the Royal College of Physicians, Edinburgh, on 24th, 26th, and 29th January, 1906.

There are many weighty arguments against the view that general paralysis and tabes dorsalis are essentially syphilitic in their origin. They have been ably stated by Bianchi and some others. The part played by syphilis is no doubt an important one, but it is only that of weakening the general and local defences against bacteria. There is the clearest evidence that the general paralytic suffers from an active bacterial toxæmia. The evidence that a diphtheroid bacillus—either an attenuated form of the Klebs-Löffler bacillus, or more probably an altogether distinct micro-organism—is the specific etiological factor in general paralysis and tabes dorsalis, is briefly as follows. A bacillus of this nature is, according to the results of our investigations, present in large numbers either in the alimentary or respiratory tract, or in both, and in the genito-urinary tract in all cases of advancing general paralysis. This bacillus has a thread form, which has been found invading the walls of the respiratory or alimentary tract in five cases of general paralysis. It can be shown that this bacillus invades the pulmonary tissues in cases of general paralysis, and that it is commonly the only micro-organism present in large numbers in the catarrhal pneumonic foci that occur in most of such cases dying in congestive attacks. A growth of a diphtheroid bacillus has now been obtained in cultures made from the brain post-mortem in ten cases of general paralysis out of twenty-four in which cultures were made from this organ. Diphtheroid bacilli exhibiting metachromatic granules in Neisser preparations have been detected in the fresh blood in one case and in sections of the brain in two cases. It has been ascertained by experimental methods that these diphtheroid bacilli in contact with the living blood are rapidly taken up by the polymorpho-nuclear leucocytes, and that they may be completely digested in the course of two or three hours. Bodies exactly corresponding in appearance to these dissolving bacilli can be detected in the blood and cerebro-spinal fluid of the living general paralytic, especially during a congestive attack. Whilst the fact that most of the bacilli present are in process of disintegration satisfactorily explains the long succession of negative results of endeavours to obtain cultures from the blood and cerebro-spinal fluid, we have, by the use of special methods, succeeded in obtaining pure growths of a diphtheroid bacillus from the fresh blood in four cases of general paralysis, and from the cerebro-spinal fluid withdrawn by lumbar puncture in two cases. In sections of the brain prepared by special methods, disintegrating diphtheroid bacilli can be recognised in the walls of the vessels and in the pia-arachnoid in many cases of general paralysis. The centrifuge deposit from the urine of the general paralytic, especially during a congestive seizure, commonly contains abundant diphtheroid bacilli that have been more or less affected by lysogenic action. In seven consecutive cases of general paralysis combined with tabes we have found the centrifuge deposit from the urine to contain not only these altered diphtheroid bacilli, but also living ones showing distinct metachromatic granules. In such cases a culture of the bacillus can be obtained from the urine. Experimental infection of three rats and a goat with diphtheroid bacilli isolated from a case of general paralysis, has resulted in the production of symptoms and tissue changes resembling those of general paralysis. Lastly, there is evidence that the active polymorpho-nuclear leucocytes of the general paralytic have, as a rule, a greater power of dissolving these diphtheroid bacilli than that possessed by the normal leucocyte.

It would therefore appear that the general paralytic has acquired against these diphtheroid bacilli a certain degree of specific immunity, by means of which he is enabled to maintain the struggle against these bacilli, notwithstanding an otherwise defective local and general power of resistance. The bacillus appears to be conveyed from individual to individual, as a rule, by contagion. There is ample warrant for the conclusion that if a mucosa is healthy the organism can neither multiply at the surface to any important extent nor invade the tissues. A preliminary weakening of the local and general defences is evidently necessary. There are numerous inimical forces that can produce this condition of impaired local and general defence, but there are three that seem to have special importance. They are the pathogenic agent of syphilis, alcohol. and nitrogenous foods used in excess. There is evidence that a mere saprophytic infection may continue for a long time without leading to any important toxic effects. It is probably only when the bacillus invades the tissues that the paralytic toxæmia becomes of any great intensity. Invasion appears to take place most commonly from the bronchi, although it can also be shown to have taken place from the alimentary tract in many cases. At the seat of such invasion what is virtually a life and death struggle between the bacilli and the leucocytes takes place. It is a conflict in which the leucocytes, after a long succession of victories, are ultimately defeated, for their power of renewal is limited, whilst that of the bacilli is virtually unlimited. Local invasion manifests itself clinically in a congestive attack. Large numbers of the bacilli reach the circulation either by way of the lymphatics or through the capillary walls. They can be seen in the blood stream in the neighbourhood of infective foci. Most of the bacilli that reach the blood are quickly seized by leucocytes and digested, but many escape from the circulation in one or other of two ways, namely, through the capillaries of the kidney into the urine, and through the walls of the cerebral vessels into the adventitial lymph channels. The further disintegration of the bacilli that takes place in these lymph channels gives rise to a local toxic action. There is thus a general toxæmia due to the disintegration of the bacilli at the seat of invasion and in the blood, and an added local cerebral toxic action dependent upon the disintegration of the bacilli that have passed through the endothelium of the cerebral vessels. In some instances the successful repulsion of an invasion is followed by a prolonged period in which the bacillus is kept at bay. Clinically this corresponds to a remission. More commonly there is a continuous comparatively slight absorption of toxins from the infective focus, and a succession of more or less severe invasions, which time after time are repelled. In the end, however, the defensive forces are overcome. There is then a fatal congestive attack. With regard to the pathogenesis of tabes dorsalis, it is to be noted that Orr and Rows have recently shown that tabetic lesions of the cord can be produced by the absorption of toxins from peripheral septic foci. The toxins pass up the perineural sheaths without injuring the nerve fibres, and affect the fibres of the posterior root as they enter the cord at the spot where they lose their neurilemma sheath. In order to account for the similar lesions that occur in tabes, it is necessary to find some peripheral toxic focus. The evidence at present points to this focus being in the bladder. In ten consecutive cases of tabes (three being cases from which material was supplied by Dr. Orr of Prestwich Asylum) abundant living diphtheroid bacilli have been found in the urine, and therefore these patients were suffering from a diphtheroid cystitis. In these cases the bacilli were present in too great numbers to have come merely from the urethra, which in other cases very frequently contains some diphtheroid bacilli. If further observations confirm the testimony of these ten cases, we shall be bound to conclude that in tabes there is in the urinary tract an infective focus comparable to that which occurs in the respiratory or alimentary tract in general paralysis. The bacilli are invading, and therefore produce toxic effects far greater than those that result from the simple passage of the disintegrating bacilli through the urinary tract.

There is evidence that the general paralytic defends himself, and often with prolonged success, by manufacturing specific bacteriolytic anti-bodies. It seems, therefore, worth while to produce such anti-bodies in suitable lower animals, and to use them as therapeutic agents. This method of treatment is to be given a trial at the Edinburgh Royal Asylum.

ESTIMATION OF THE FUNCTIONAL POWER OF THE HEART BY THE AID OF ORTHO-DIAGRAPHY.

By Paul C. Franze, M.D., L.S.A. (Lond.), *Bad Nauheim.*

(Plate VI.)

When the functional power of the heart sinks below a certain minimum necessary for maintaining the circulation, signs of cardiac failure appear, and if these be not successfully combated, death will ensue. Prophylaxis, therefore, and prognosis of heart disease depend on our capacity to estimate the functional power of the central organ of circulation.

Functional Diagnosis.—Which factors in the physiology and pathology of the circulation relate to it, and what is their respective value?

1. *Blood pressure.*—The height of the pressure in the arterial

system depends on the total of the propulsive forces and of the resistances. The former are constituted by the contractions of the ventricles and the elasticity of the arterial walls. One, therefore, concludes that, in absolute insufficiency of the heart, the blood pressure will fall, and this is generally, but not always, the case. On the other hand, however, fall of blood pressure is no criterion of weakness of the heart, because it may be due to a loss of arterial tone out of proportion to the contractile vigour of a normal or even over-strong heart. Far less still is high blood pressure a sign of a strong heart, for it may be, and almost always is, due to increased resistance in the vessels; thus we find it in chronic nephritis, arterio-sclerosis, and vasomotor spasm, so long as there is no absolute insufficiency of the cardiac muscle. But even then in exceptional cases blood pressure need not decrease, for Katzenstein has found in impending death in cardiac disease the blood pressure remaining high. This proves that there must be at least one factor concerning the regulation of the pressure in the arteries which is as yet unknown to us. The same observer found in athletes during repose low figures, whilst in many cases of cardiac dilatation, anæmic girls, etc., high figures of blood pressure are often recorded. This is evidence enough to minimise the value of blood-pressure measurements for functional diagnosis of cardiac cases.

2. *Pulse.*—Frequency, rhythm, and volume of the pulse are quite useless in themselves as criteria of the strength of the heart. The volume is chiefly a local symptom. The vital processes in regard to the distribution of the blood constitute a continuous change of hyperæmias from one organ to another, the organs at work always being supplied with an excess of blood, compensatory contraction of the vessels in the ones at rest ensuing at the same time. A radial pulse of large volume may merely, therefore, be a sign of contraction of the splanchnic vessels. Frequency and rhythm are governed by the nervous system, and neurotics with sound cardiac muscles may have abnormally quick or irregular pulses, or respond with such to slight mental or bodily exertions. Methods, therefore, based on estimating the cardiac functional power according to the change in the frequency of the heart's action before and after given measured exercises, are fallacious.

3. *Respiration.*—Dyspnœa during repose, if other than cardiac reasons be excluded, is undoubtedly a sign of failure of cardiac force. But the reverse, absence of dyspnœa, is, of course, no guarantee of a sound heart, beyond that it excludes absolute insufficiency at the time of examination.

4. *Urine.*—Scanty urine, high specific gravity during repose (if sources of error, as by increased perspiration, abnormally limited ingestion of fluid, or nephritis, etc., be excluded) are signs of cardiac failure; so is albumin in the absence of renal disease.

But as is the case with respiratory symptoms, these signs are often wanting even in advanced insufficiency.

5. *Cyanosis.*—This, if the lungs be sound, is, in my opinion, one of the best qualitative criteria of insufficiency in the circulatory system. A bluish hue of the lips and finger-nails is most characteristic of heart disease, and almost invariably disappears with the improvement of the case. But no one would think of founding a quantitative estimate of the cardiac energy on this symptom alone.

6. *The size of the heart.*—The heart is the principal and central driving power for the maintenance of the circulation. The systoles have to overcome the resistance offered by the blood stream, and the blood therefore exercises pressure on the cardiac walls. If, from any cause, the energy of the systoles becomes inadequate to *over*-compensate to a certain *minimum* degree the resistances to the current, then the cardiac muscle must become dilated. Thus a heart of sufficient functional capacity is non-dilated, and, conversely, the heart must respond by dilatation to insufficiency of its functional power. This is generally true, though there are some exceptions, which shall not be adverted to here. The size of the heart is, therefore, the *best,* although *no absolute,* criterion for estimating its functional capacity. But it must be measured for this purpose with exactitude. To do this by percussion is impossible. Only by use of the Röntgen rays, by the method known as "ortho-diagraphy," can it be achieved. An ortho-diagram is a mathematically exact tracing of the outlines of an object, not an enlarged reproduction, as is the ordinary X-ray photograph.

Believing, then, that an exact measurement of the cardiac circumference is of paramount importance for the estimation of the functional power of the heart, and, further, that this can only be done by ortho-diagraphy, I shall endeavour to set forth its theory and technique.

An ordinary radiograph renders the outlines of the object enlarged; to understand why this is the case, and how it may be obviated in using X-rays, we must consider briefly the laws of projection of shadows. If a source of light casts the shadow of a body on a plane surface, we must distinguish whether the light rays are divergent or parallel. The former is the case in central projections. In a *true* central projection the source of light is mathematically a point. In a spurious central projection the source is a luminous body or plane; for instance, the flame of a lamp, etc. In this case, every one of the indefinite number of spots of the luminous body forms a separate centre for the emanation of light rays, and throws a shadow of the object; the contours of the shadow in this case are ill-defined. Now, all terrestrial sources of light give true or spurious central projections. The X-rays emanate approximately from the centre of the anticathode of the tube, their projection thus being practically a true central one. Fig. 1 will best show the mode of enlargement of the object in a central projection: *a* is the centre of projection from which the light emanates; *b c* is the diameter of an object; the ray *a d* casts the shadow of *b* to *d* on the plane of projection *d e*, and the ray *a e* casts that of *c* to *e*; thus *d e* is the shadow of *b c*; it is obvious that the enlargement is the greater the nearer the object be to the projecting centre, and the less the further away it be. If the same object be situated at *b′ c′*, its shadow will be *d′ e′*.

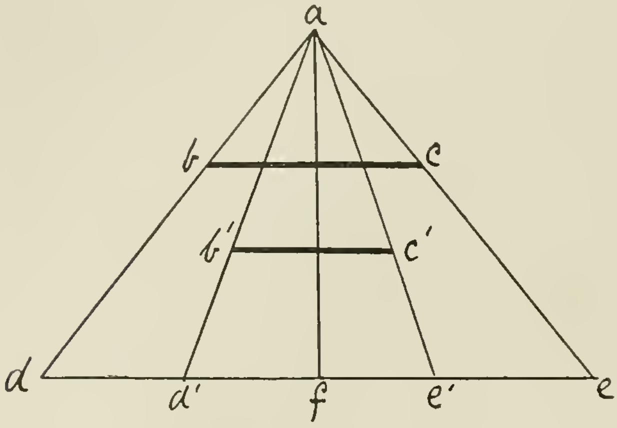

Fig. 1.

If, however, the rays of light are parallel to each other, we have what is called a parallel projection. Such is the case with sun rays, owing to the extreme distance of the sun. In this case the shadow corresponds in size exactly to the object, as is shown by Fig. 2: *a c* and *b d* are two parallel rays of light projecting the ends of the diameter of an object *a b* to *c* and to *d* respectively; *c d*, the shadow, is equal to *a b*. If, however, the object be not situated parallel to the plane of projection *c f*, then in the case of parallel rays the image will be somewhat smaller than the original, as is easily seen from the position of *a′ b′* in Fig. 2.

In radiographing parts of the skeleton, foreign bodies, or urinary calculi, the magnification due to the central projection of the X-rays is practically irrelevant, and, besides, it is not very great, as the parts can usually be brought comparatively near to the photographic plate, *i.e.* the plane of projection in this case. But, regarding the heart, the enlargement in skiagraphy is considerable, as the greatest circumference of this organ is about 7 to 10 cms. behind the surface of the chest; and, moreover, we desire to ascertain its exact size for our purpose of functional diagnosis. This can be attained by using the orthodiagraph, as devised by Professor Moritz, which enables us to get a parallel projection by X-rays. The theoretical considerations for its construction are as follows:

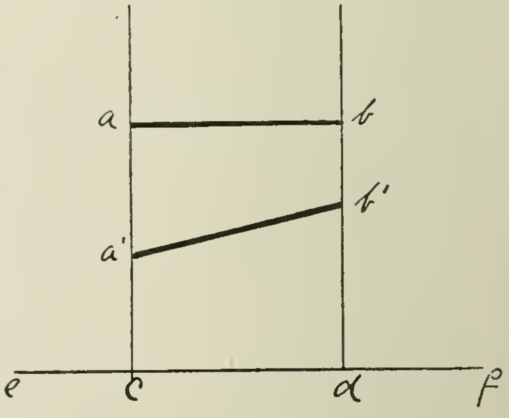

Fig. 2.

There is one ray emanating from the anti-cathode of the tube which is perpendicular to the plane of projection, say, the screen; it is shown in Fig. 1 by *a f*. If the means were given to conduct this one ray round the circumference of the object, and at any moment to mark the outline of the shadow projected by it alone, then we would obtain by carrying this out a parallel projection in continuity, for the perpendicular ray, in being moved, always remains parallel to itself. The apparatus used consists of three metal bars meeting in shape of a "U," and adjustable as to their relative positions. The rear one holds the focus tube, the front one a pencil fixed exactly opposite to the centre of the anticathode, so that the perpendicular ray hits the point of the pencil. The bar connecting the front and rear ones constitutes at the same time an axis around which front and rear bars are movable in all directions of two planes respectively, which are parallel to each other and vertical to the perpendicular ray, and in which the front and rear bars respectively lie. Besides that, the whole apparatus can be moved upwards, downwards, and to the right

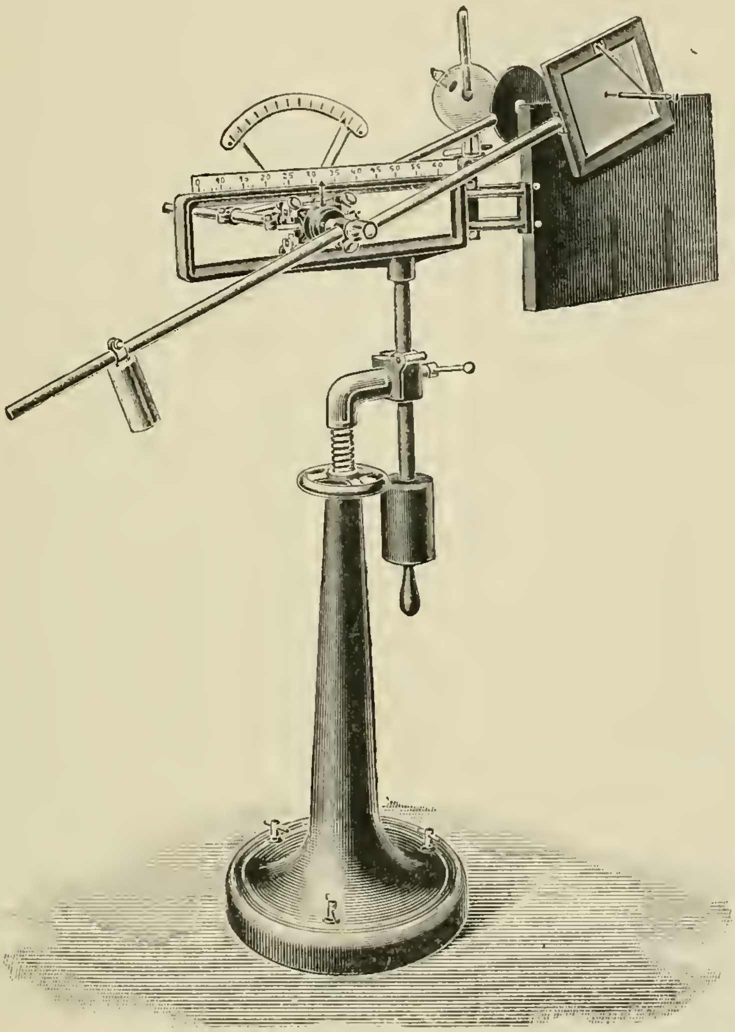

Fig. 3.

and left, the front and rear bars always remaining in the planes described, and without tube or pencil changing their relative positions to each other. The whole is fixed to a firm stand, and a system of levers and weights maintains a condition of approximately indifferent equilibrium of the bars. Now, the front bar holds an X-ray screen, through the centre of which the pencil

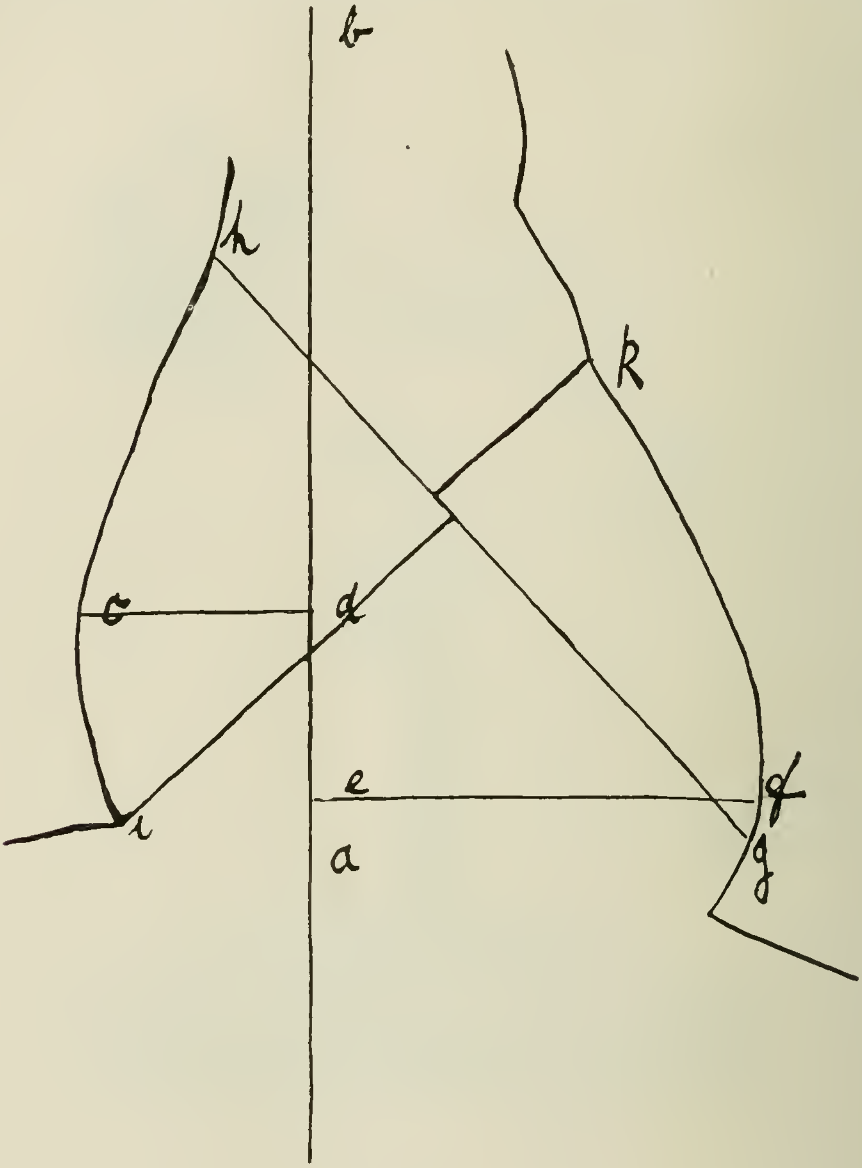

FIG. 4.

projects; the patient is placed between rear and front bars, *i.e.* between tube and screen with the pencil, his back towards the tube. In working, the shadow of the heart is, of course, distinctly seen on the screen; if we now mark the outlines of the shadow with the pencil—a dermatograph being used—on the patient's chest, then we are only marking the projections of the one perpendicular ray (*a f* in Fig. 1), as this is hitting the point of the pencil, and the tube moves along with the screen and pencil,

maintaining its relative position to the latter. Thus, the tracing so obtained on the chest corresponds exactly to the outlines of the heart.

In Fig. 3 one of the best types of ortho-diagraph of the present day, namely that according to Dr. Levy-Dorn, is shown.

To demonstrate the magnification by ordinary radiographs, I have appended the following figures (Plate VI. and Fig. 4). Plate VI. is a radiograph of the heart, whilst Fig. 4 is the ortho-diagram of the same heart.

The measurement of an ortho-diagram of the heart is referred to certain points of interest. First we draw the median line of the body (Fig. 4, *a b*), and then from the points most distant from it on the left and right borders two perpendiculars to *a b*, namely, *c d* and *e f*. By adding both together, we obtain the "transverse dimension" of the heart; moreover, the right line *c d* (left-hand side of figure) corresponds to the diameter of the right auricle, *e f* to that of the left ventricle. A fourth line (*g h*), from the apex to the spot where the straight border of the vena cava superior meets the convex outline of the right auricle (*h*), designates the entire length of the heart. We now add two perpendiculars to this latter line, one from the junction of the border of the right auricle with the diaphragm (*i*), and one from the junction of the border of the pulmonary artery with that of the left ventricle (*k*); both added together constitute approximately the diameter of the right ventricle.

The right border of the ortho-diagram is constituted above by the border of the vena cava superior, below by that of the right auricle; the left border of the figure is made up from above downwards by three convexities, namely, aortic arch, left pulmonary artery (sometimes with part of the left auricular appendix), and border of left ventricle. Below, the outlines of the heart meet with those of the diaphragm on both sides.

For carrying out these measurements with exactitude, good apparatus, thorough fixation of the patient, and the acquirement of a certain amount of technical skill are necessary; but these requirements once given, we have by ortho-diagraphy the means of ascertaining the outlines of the cardiac area, and of basing our prognosis on such measurement.

SOME NOTES ON "KOPFTETANUS," WITH AN ACCOUNT OF TWO CASES.

By T. W. E. Ross, M.D., F.R.C.S.Ed.

Under the heading "Tetanus," in most British text-books of medicine or surgery, may be found a few lines of reference to a special variety of that disease known as "kopftetanus" or "cephalic tetanus." Some authors deny that there is such a variety, yet in the literature of the subject I was able to find 104 cases described as examples of kopftetanus.

Of the above number, eighty-one cases were claimed to be examples of kopftetanus owing to the occurrence of some degree of paresis or paralysis affecting one of the cranial motor nerves, in addition to tetanic phenomena; while twenty-three cases were so designated because tetanic phenomena followed on a cranial wound, and seemed to affect in a marked degree the muscles of deglutition and respiration. These latter cases were examples of the once so-called "tetanus hydrophobicus" of Rose, but a close analysis of these cases shows that they cannot be regarded as a distinct class of tetanus. The cases showing paralysis, however, form a distinct and interesting group, and of this type the following definition may be given:—Kopftetanus is a peculiar form of tetanus, which results from specific bacterial infection of a wound or abrasion on the face, forehead, or scalp; and which is distinguished by paresis or paralysis of one or more of the motor cranial nerves, and in rare instances by sensory disturbance of the fifth nerve, in addition to ordinary tetanic phenomena of variable extent and severity.

The cases show a tendency to localisation of tetanic spasm in the muscles of the lower jaw and neck, and in those connected with deglutition and respiration; but many of them exhibit the symptoms of generalised tetanus of the most acute type, hence it is a mistake to classify kopftetanus as a variety of chronic tetanus, as is done by some authors.

While acting as house physician in the Royal Infirmary, Edinburgh, with Dr. Andrew Smart, I had the opportunity of observing the following case, which Dr. Smart has kindly allowed me to publish:—

Case 1.—A. M'P., æt. 31, railway porter, fell down while unloading a waggon, and sustained a few slight scratches on the left temple. He was able to continue work. Two days later he noticed twitching of the left facial muscles, also that he could not close his left eye. The facial twitching continued for three days, and was then succeeded by flaccidity of left cheek, the mouth being drawn to the right side. He continued work, though he was troubled by dust getting into his left eye. On the twelfth day after the fall, the muscles of mastication felt stiff and sore, on attempting to eat solid food. Cramp-like contractions of these muscles, causing severe pain, gradually came on. On the fourteenth day stiffness of the muscles of the back and thighs was noticed, and painful contractions of these muscles also occurred. By the sixteenth day after the fall, the muscles of the neck, back, and lower extremities were so stiff that he could not move in bed, and painful cramp-like contractions, lasting about five seconds, of one or other, or all, of these groups of muscles occurred nearly every minute. Eighteen days after the injury, patient was admitted to Ward 32, Royal Infirmary, Edinburgh (February

24). On admission, patient seemed very exhausted; he could only speak through his clenched teeth, but was able to give the history of the onset of his illness.

A small scar, partly covered by a dry scab, was visible at the outer angle of the left orbit, also a small scab above the left eyebrow. He was perspiring profusely, and lay extended in bed unable to flex his lower limbs, or to bend his neck and back. He could move his arms freely. The affected muscles felt hard and knotty, which conditions were accentuated during an attack of spasm. The spasms occurred every one or two minutes, about one attack in five was generalised, *i.e.* affected muscles of the lower jaw, neck, back, abdominal wall, thighs, and calves; the rest were localised to one or more of these groups. Each spasm caused great pain.

The furrows on left half of forehead and the left naso-labial fold were absent. The left eyebrow could not be raised, the left eyelids could not be approximated, the mouth was markedly drawn to the right side, and also, to a less extent, the nose. The right upper eyelid could not be raised. The mouth could not be opened. Any attempt at physical examination of the patient provoked spasms, but so far as could be discovered the circulatory, respiratory, alimentary, and urinary systems were healthy. Electrical examination of the left facial nerve was impossible, on account of the condition of the patient.

Bacteriological examination of the wounds was negative.

Course and treatment:—

February 24.—Patient took plenty fluid nourishment. Given large doses of bromides and chloral every four hours. By 10 P.M. spasms became less frequent, and patient had a few hours' sleep.

February 25, 10 A.M.—Spasms every quarter of an hour, not severe; took nourishment well. Given 30 c.c. tetantus antitoxin (Tizzoni), intramuscular injection. Chloral and bromide continued. In afternoon condition generally improved, but one of the spasms was generalised and severe. 8.30 P.M.—¼ gr. morphia, hypodermically. 11.30 P.M.—Patient had a very severe attack of spasm, which affected practically all the muscles of the body, including those of the right half of face and of the upper extremities. The left facial muscles remained flaccid, the left palpebral fissure remained wide open, and the left eye was rotated upwards and outwards. Opisthotonos was marked. The breathing became rapid, laboured, and shallow; inspiration being accompanied by a hissing sound. For some seconds respiration ceased, the patient became deeply cyanosed, and some blood-stained froth appeared at the lips. Patient passed urine involuntarily. After a few seconds the spasm gradually relaxed, and in a few minutes the patient was breathing tranquilly. Chloroform was administered during this attack.

February 26.—From 2 A.M. till 10.30 A.M. the patient was quiet, and had a fair amount of sleep. In the forenoon he could move his lower jaw a little, and could bend his knees. 11 A.M., 20 c.c. tetanus antitoxin (Tizzoni) injected into muscles. Patient only had a few slight localised spasms till 1.45 P.M., when, after drinking a cup of beef-tea, he suddenly felt sick and his respiration ceased. The right facial muscles became spasmodically contracted, and the arms were held rigidly flexed over his chest. The muscles of his back and thighs were not affected by spasm, and the lower jaw was not clenched. Patient became cyanosed rapidly. Attempts at artificial respiration and the administration of chloroform were unavailing. The thorax was absolutely rigid. The pulse was feeble, but was felt to go on beating for forty seconds after respiration had ceased.

The post-mortem examination was negative, as were cultures made from the blood and from the wound. Sections of the facial nerve from the paralysed side revealed no microscopic change.

Case 2.—By kind consent of Dr. Gillett, Andover, I am able to give the following facts about another case :—

October 10, 1900.—A lady was thrown out of her dog-cart, and sustained a scalp wound, which was contaminated with road mud. The wound was about 4 in. long, and was situated on the right fronto-parietal region. An anæsthetic was given the same afternoon, and the wound was thoroughly cleansed.

October 11.—Progress of patient satisfactory.

October 12.—Patient complained of pains in region of muscles of lower law. In the evening these muscles felt stiff, and the mouth could only be opened with difficulty. The wound was again cleansed.

October 12.—Patient on waking noticed that she could not close her right eye. She was unable to open her mouth. On examination, the right facial furrows were absent, the right half of forehead was smooth, and the right facial and frontal muscles appeared to be flaccid. The left half of the forehead and of the face showed exaggeration of furrows ; and the mouth was drawn to the left side. The right pupil was markedly dilated, and did not respond to light or accommodation. Trismus was marked, and the nuchal muscles were stiff. Large doses of bromide and chloral were given, and antitoxin was sent for.

October 13.—Patient had fair amount of sleep ; condition unchanged. In evening, tetanic spasms appeared, affecting the muscles of the jaw, neck, and trunk. The spasms occurred about every half-hour.

October 14.—Patient had a sleepless night ; spasms were more severe, the muscles of the lower limbs being also affected. In the evening patient had difficulty in swallowing. Any attempt to swallow liquids brought on generalised spasms, during which respiration was much impeded. The reflex irritability of muscles became marked, any slight external stimulus causing spasms. Bromide and chloral continued ; tetanus antitoxin treatment commenced.

October 15.—No improvement ; arm muscles also affected by spasm. Temperature, 104° F. ; pulse, 120.

October 16.—Death from heart failure during a severe spasm.

Consent for post-mortem not obtained.

These two cases, while good examples of kopftetanus, show one or two points of interest, which may be briefly noted.

In Case 1, the early onset of the facial paralysis is remarkable. In only 11 per cent. of the collected cases does facial paralysis appear before the onset of trismus (1). In no other case is twitching of the facial muscles described as preceding their paralysis. Ptosis is only noted in four other cases, in two of which the ptosis was on the same side as the facial paralysis, but in two, as in this case, it affected the opposite side. Strabismus is described in two other cases, nystagmus in no other case. The early appearance of facial paralysis is almost invariably associated with a fatal termination.

Case 2 is a typically severe case, the only unusual feature being the persistently dilated pupil on the same side as the paralysis.

Without entering into detailed statistics about the cases, it may be stated that the general mortality was 55·4 per cent., a somewhat lower figure than that generally given for ordinary tetanus. The average incubation period in fatal cases was 6·9 days, that in non-fatal cases 8·8 days; but both varied within somewhat wide limits. The initial symptom in thirty-two cases was trismus; in twenty-six cases the onset of paralysis and trismus was simultaneous; and in nine cases paralysis was the first to appear. Eleven cases exhibited some stiffness or contracture of the muscles of the neck, or of the face, as the first evidence of disease.

It is remarkable that in the cases where paralysis appeared first, the mortality was 77·7 per cent., and if we omit one case, where the history is a little doubtful, it rises to 88·8 per cent., contrasted with the general average of 55·4 per cent.

I shall now make reference to the peculiar symptom of paralysis.

Out of eighty-one cases showing facial paralysis, sixty-eight suffered from unilateral paralysis on the same side as the wound, five from this symptom on the opposite side to the wound, and eight showed bilateral facial paralysis. Of the last-mentioned, it is interesting to note that six cases had skin lesions situated about the mid-line of the nose or forehead.

One case of unilateral paralysis (2) was remarkable in that the supposed entrance of the bacillus was a wound under a finger-nail. If the supposition were correct, then this is the only case of kopftetanus where the wound was outside the area of distribution of the cranial nerves. In about twenty cases, the paralysis was limited to the groups of muscles supplied by either the upper or the lower branches of the facial nerve. In most of these cases, the group of muscles affected was that situated nearest the wound, but in seven cases the group remote from the wound was paralysed,—for example, a cut over the left eyebrow being associated with a paralysis limited to the muscles about the left angle of the mouth.

There has been no evidence of involvement of the sensory fibres connected with taste, found in the seventh nerve between the genu and origin of the chorda tympani; nor has paralysis of the stapedius muscle been suggested.

Electrical examination of the paralysed facial nerve has, where made, always proved negative as regards signs of reaction of degeneration.

Paralysis affecting the oculo-motor nerve has been noted in six cases, the paralysis being limited to the levator palpebrarum superioris.

Of these six cases, one showed bilateral ptosis, while five exhibited unilateral ptosis. In the latter group, two cases suffered from facial paralysis on the same side as the ptosis, two from facial paralysis on the opposite side, and one case had bilateral facial paralysis, with ptosis on the side remote from the wound. Several cases showed varieties of strabismus, but from the details given, one cannot determine whether the phenomena were due to spasm or to paralysis of the ocular muscles. In two cases the pupil was permanently dilated on the same side as the facial paralysis, the dilation probably pointing to paralysis of the ciliary branches of the third nerve.

Paralytic affection of the fourth or sixth nerves has not been observed.

By two writers (3) paralysis or paresis of the twelfth cranial nerve has been described. The presence of trismus naturally interferes with observation of the movements of the tongue. In these two instances, partial paralysis of one-half of the tongue was noted, after the trismus began to disappear, and when the patients were recovering. The half of the tongue affected was in each case on the side corresponding to the lesion and to the facial paralysis.

Spasm affecting the muscles of the tongue has been noted in two cases.

In three cases the condition of the soft palate was specially observed. There appeared to be some paresis of the muscles in two of these cases (Behr, Schultze). It is possible that the pupillary fibres of the cervical sympathetic have been affected in four cases, where the pupils are described as being permanently contracted. In two cases, profuse perspiration was noted over the paralysed half of the face, but in these cases there were no pupillary signs. There is no evidence in cases of tetanus of motor nerves, other than cranial, being affected by paralysis.

Among the cases of kopftetanus are one or two examples of local hyperæsthesia or local anæsthesia within the area of distribution of the fifth nerve on the same side as the facial paralysis.

The older writers on kopftetanus attributed the paralysis to inflammation of the trunk of the facial, consequent on chill, or a rheumatic diathesis; or to reflex irritation from the wound, and so forth. More recently the phenomena have been attributed to a peculiar action of the tetanus toxin, and, since the experimental work of Klemm (4), Brunner (5), Marie (6), Brieger (7), Binot (8), and others, it is generally believed that there is a special element in the toxin which may cause paralysis.

Whether the toxin, in producing the paralysis, acts peripherally on the motor nerve endings, or centrally on motor nerve cells, is still under discussion. Brunner, Klemm, and others hold the former view, basing it on the fact that inoculation of rabbits with the crude toxin produced paralysis of facial muscles in the neighbourhood of the puncture, and that the facial nerve, in proximity to the point of inoculation, showed early marked decrease of irritability to the faradic current, and that the muscles nearest the same point gave the reaction of degeneration. The fact that in most of the recorded cases the paralysed nerve is in close proximity to the wound might seem to support the view of peripheral action. Nerlich (10), Mayer, Neuman (3), and others have upheld the view, that the paralysing element in the toxin acts on the motor nerve cells in the central nuclei of the cranial nerves. In two cases microscopic changes have been described in the motor nuclei. Nerlich described bubble-shaped formations in the motor cells of the twelfth nucleus on the side corresponding to the wound, and also little vacuoles in the cells of both seventh nuclei. In this case there had been unilateral facial paralysis on the same side as the wound, but hypoglossal paralysis, even if present, could not have been observed owing to complete trismus and an early fatal termination.

Bourgeois (11) stated that sections through the twelfth nucleus revealed pigmentation in some of the motor cells, but he thought the appearance might be due to a faulty method of staining. Only facial paralysis was observed in this case. Two cases, where hypoglossal paralysis or paresis was observed, are cited in support of the theory of central action. In these cases the lesions were remote from the area of distribution of the hypoglossal nerve affected, though on a corresponding side. In each case there was also facial paralysis on the same side as the lesion.

It is evident that the twelfth has no immediate connection with the seventh nerve, except in so far as its nucleus is in proximity to the seventh nucleus. Thus hypoglossal paralysis may be explained by supposing that the paralysing element in the toxin, reaching the centrum by way of the seventh nerve, affects the motor cells in the seventh nucleus, and then, passing on, affects those in the neighbouring twelfth nucleus.

As already mentioned in discussion of the varieties of paralysis, the nerve, or branch of a nerve, affected, is in a number of instances remote from the wound, the branches in the neighbourhood of the lesion being unaffected. In relation to this fact, it is interesting to note that recent authorities (9) believe that in any case of tetanus the toxin is absorbed by the axons of the motor nerves in the vicinity of the point of inoculation, and is thence conducted to the central nervous system, where the tetanising element of the toxin affects the motor cells.

I think it most reasonable to suppose that the paralysing element, like the tetanising one, acts centrally, but limits itself to the motor cells of the nuclei in the pons and medulla. Its action must be capricious, not necessarily affecting those cells lying first in its path, and apparently its effect is to cause a functional paralysis or paresis. The evidence of organic change in the nuclear cells is not satisfactory, and the paralysis, in surviving cases, proves transient.

Why this special effect should occur only in cases where the point of inoculation is within the area of the scalp and face, and, indeed, only in a proportion of such cases, cannot be explained by the available experimental, pathological, or clinical evidence. In these cases there may, for some reason, have been the production of a peculiar toxin, but more probably there has been some special predisposition of some of the nuclear cells to be affected by the paralysing element in the tetanus toxin.

In conclusion, it may be remarked that "tetanus paralyticus," a term originally suggested by Klemm, seems the most appropriate name for a variety of tetanus whose sole claim to distinction is the presence of paralysis of one or more of the cranial nerves.

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A CASE OF ECLAMPSIA FOLLOWED BY PUERPERAL MELANCHOLIA, WHICH WAS TREATED WITH THYROID GLAND SUBSTANCE.[1]

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Bearing in mind the interest which has been displayed by members of this Society in puerperal eclampsia, and also in the varied therapeutic applications of thyroid gland substance, I venture to submit the following isolated observation, without waiting for other cases to occur in my own practice. The theoretic considerations which it illustrates are familiar to the members of the Society. I therefore submit a simple record of the case, in the hope that additional observations may be added by others as occasion may arise.

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[1] Communicated to the Edinburgh Obstetrical Society, January 10, 1906.

Case.—Mrs. B., æt. 44 years 9 months, was admitted to a private nursing home on 3rd April 1905, being then within a few days of the end of her first pregnancy. The urine contained a trace of albumin, but was otherwise normal in quantity and constitution. There was slight œdema of the hands and feet. The general health during pregnancy had been good. Constipation had been prevented by the use of aperients. The patient had been married for three years, menstruation had always been normal, and the personal and family history presented no features of interest. During the week following admission the œdema disappeared, and the urine became free from albumin. The only treatment employed was extra attention to the bowels and restriction to light, and mainly vegetarian diet. On 10th April labour began at about 6 o'clock a.m. Dilatation went on satisfactorily during the day, and was complete at about 7 o'clock p.m. when the character of the pains changed, and voluntary expulsive efforts began. The membranes were then ruptured, and the head descended gradually on to the perineum. Having in view the age of the patient, I judged that the use of the forceps would be required sooner or later, and at 9 o'clock I had the instruments prepared for use by boiling. I was in the act of opening a bottle of chloroform with a view to administering a little during each pain, when the patient began picking at the bedclothes. Her eyes then became fixed, and a moment after she was in the midst of a violent eclamptic seizure, which passed off after some three minutes, leaving the patient semi-conscious. I immediately sent for a colleague, who arrived in a quarter of an hour, and at once anæsthetised the patient, in order that I might deliver her without bringing on another fit by the necessary manipulations. The forceps being applied, I incised the perineum on each side and gently delivered the child at 9.20 p.m.[1] As the mother had a full hard pulse, we decided that bleeding would be beneficial. I therefore partially separated the placenta as soon as the child was born, and allowed blood to flow from the placental site until about 15 oz. had escaped. I then completed the separation of the placenta and membranes, and put a catgut stitch in each of the lateral incisions in the perineum. By 11.30 the patient was fit to be left, though not quite fully conscious. Next morning her condition was quite satisfactory, but the pulse was full and hard. At 1 p.m. I saw her again (sixteen hours after labour), and whilst talking to me she was again seized by the most severe convulsion I ever witnessed. The patient appeared to be in danger of immediate death from cerebral hæmorrhage, so I opened a vein with my pocket-knife, after twisting a towel round the upper arm, and collected 18 oz. of the blood which escaped. During the afternoon a consultation was held, and it was decided that if there were any threatenings of a further attack, I should bleed her again in the evening.

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[1] Artificial respiration, with the use of the hot bath and sprinklings of cold water, was continued for one and a half hours before the child breathed well and independently.

Meanwhile she was bathed in perspiration, being kept in a wet pack, surrounded with hot-water bottles, which were renewed from time to time. In the evening, at 7 P.M., she could be roused without difficulty, but when undisturbed her breathing was stertorous, and there was slight facial twitching. The pulse was once more hard, full, and slow. I bandaged the arm, and allowed blood to flow until the pulse became soft and more rapid. The blood collected measured 15 oz. The wet pack was continued through the night and all the next day, though the condition was then quite satisfactory. Rectal lavage was done every day subsequently, and the diet was restricted to milk. At this time there was a moderate amount of albumin in the urine, but it rapidly disappeared. The patient complained of very bad headache, limited to one side of the head. She spent most of her time asleep, and said the headache was worse on waking. On the fourth day the child died, which upset her considerably. At the end of the week, however, her condition was in every way satisfactory, except for the headache. At the end of the second week, she was out of bed for an hour or two at a time. The headache was better when she was propped up than when lying flat in bed, but still continued. She was eating well, the diet being still vegetarian. On the fifteenth day (April 17), the headache was troublesome, and, after being restless in the afternoon, the patient was rather hysterical in the evening; the temperature rising to 100°·5.[1] The next morning (sixteenth day) signs of melancholia appeared. She refused food entirely, and became irrational. Speech was affected, and was muttering and unintelligible. She slept heavily hour after hour, and could only be roused with difficulty, when she recognised no one, would not do anything she was told, and uttered no word except an attempt at "sleepy." The pulse was very slow on some occasions, being only 46 per minute; its character was good. There was at this time no albumin in the urine, which was normal but for the presence of a large quantity of urates. On two or three occasions it was passed in the bed. Though the bowels had been moved regularly, the alvine evacuations must have been incomplete, for, on employing intestinal lavage, quantities of very foul-smelling material was passed during the next few days. The condition of stupor continued for several days, with one or two attacks of restlessness, which were relieved by a few doses of bromide of potassium. After the first day of the melancholia there was no great difficulty in administering nourishment, washing out the bowel and the like, though the patient did not help herself for several days. When the low condition, constant sleep, slow pulse, and inability to speak had continued three days, I began giving 5 grs. of thyroid substance each day. This was done, because this substance has proved invaluable in the pre-eclamptic state in my own hands, and has given good results even in actual eclampsia in the hands of Oliphant Nicholson and other observers. I have been teaching since the year 1900 that the poison is the same or nearly the same in eclampsia, in melancholia and mania, in the amblyopia, and in polyneuritis in pregnant and puerperal women. Turney pointed this out.[2] "The cortical cells in the brain," he says,

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[1] This one evening, it may be mentioned, was the only occasion during the whole of the illness on which the temperature rose above 99° F.

[2] *St. Thomas's Hosp. Rep.*, London, vol. iv.

"the motor nuclei in the pons, the purely sensory tract of the optic nerves, the nerves of the medulla, and finally those of the extremities, all in turn may suffer from the effects of the poison." This is the first case, however, in which I have observed both eclampsia and melancholia in the same patient.

The pulse rate gives an indication of the action of thyroid substance, and I observed an increase of five or six beats per minute after two tabloids had been given. After the third the pulse rate rose to 60, and a considerable improvement was noticeable in the patient's general condition. This was seven days from the onset of the melancholia, and daily progress was made subsequently. The patient began to recognise us, and to help herself. We got her out of bed again a day or two later, with a view to having her removed to the country as early as possible. By 4th May she talked about members of her family, but mixed their names. She recognised an uncle who came to see her, and burst into tears on doing so. On being asked the next day if she had seen her uncle, she remarked, "Yes; we all cried." She was now conscious of some mental incapacity, and also of loss of memory. The pulse was 70, the tongue was clean, and the bowels were again in perfect order. The urine was normal. The patient was again taking food well, and slept all night and most of the day. On 6th May she was put in a carriage and driven twenty-four miles to the home of a relative. Her doctor met her on her arrival, and found her physical condition perfectly satisfactory, memory badly impaired, and speech defective. She was, however, quite sensible, and was conscious of her mental state. The treatment by thyroid substance was continued, and the dose was not increased, since the small quantity given was found to affect the pulse rate very considerably. On 15th May the doctor wrote that the patient was practically well. "The time from the confinement until her removal from the nursing home seems to have slipped her memory, and remains a blank." The use of thyroid substance was then stopped. In October 1905 the patient remained perfectly well.

The nervous diseases associated with pregnancy and the puerperium are striking examples of toxæmic states which are associated with defective metabolism, and also with absorption from the intestinal canal. While we are unable as yet to prove the relationships of these factors in the causation of the toxæmias of pregnancy, we have abundant clinical evidence that these toxæmic states are eminently amenable to medical and hygienic treatment. Let chorea during pregnancy serve as a single example. Many cases have ended fatally, and the artificial interruption of pregnancy has been demanded in many more, not always with favourable result. We find, however, that it is possible to control the condition in most cases by the same treatment which is employed in threatened eclampsia, or the pre-eclamptic state. The patient is kept in bed; her bowels receive careful and vigorous attention, the large intestine being washed out daily. Her diet is restricted to milk and vegetable substances. Her skin is made to act either by hot baths, by steam or hot air baths, or by prolonged wet packs. Further, thyroid substance[1] may be freely given, as a stimulant to the metabolic changes. By these methods it is found possible in most cases to avoid interference with pregnancy, and to obviate all risk to life.

The melancholia and mania of pregnancy and the puerperium should be regarded as toxæmic states affecting the mental functions, and demanding active treatment. The mental disturbances associated with child-bearing receive but little attention, probably because it is realised that most of the patients ultimately recover under merely expectant treatment. But if we consider the amount of suffering caused by these conditions, especially the mental pain inflicted upon relatives and friends of the patients, it is clear that recovery in these cases should be hastened by every means in our power.

It is one of the best traditions of the profession that those mentally afflicted during pregnancy and the puerperium should be treated at home when possible. For various reasons, however, many cases are treated in our asylums. A useful piece of clinical work could be done if some of our colleagues would ascertain by reference to their records the average duration of these cases as treated hitherto, and would also ascertain by clinical experiment whether this average duration could not be shortened materially by active antitoxæmic treatment.

CONGENITAL HERNIA OF THE APPENDIX.

By W. K. Hutton, M.A., M.B., *Lecturer in Regional Anatomy, the University of Glasgow.*

(Plate VII.)

The condition to be presently described occurred in the body of an elderly well-nourished male, a subject in the dissecting room of the University of Glasgow. Owing to the difficulty in identification which presents itself when once dissection is commenced in earnest, it was found impossible to obtain any information regarding either the life history or the cause of death. My own attention was not, in this instance, directed to the dissection of the abdomen until a careful preparation of the parietes and inguinal region had been made by the dissector, Mr. Hugh Young, who announced to me the presence of a right scrotal hernia. I found the sac exposed but unopened. The rupture was of the common inguinal type,—external to the deep epigastric artery and directed obliquely along the inguinal canal, its covering consisting of the usual layers.

An incision was carefully made along the anterior aspect of the sac, in such a manner as to stop short of the constriction forming its neck, and on turning aside the two flaps, the following condition of parts was disclosed (see Plate).

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[1] A colleague, Dr. Shaw, has now in preparation for publication a series of records of cases of chorea gravidarum treated with thyroid substance.

The sac measured from the neck to the base 12 cms. Projecting into the cavity, which it crossed very obliquely from right to left of the mid-ventral line, was a mesentery (M), 9 cms. in length and 2·5 cms. in greatest breadth; by this mesenterial attachment the appendix vermiformis (A), measuring 7·5 cms. in length, was fastened to the wall of the sac immovably in the long axis of that cavity, but freely mobile laterally. This appendix seemed to be perfectly normal in every respect; its lumen was patent, and its external diameter about 6 mm. It received a thoroughly adequate blood supply by means of a long, slender, and well-injected branch of the ileo-colic artery. There were no adhesions within the sac, there was nothing to indicate either recent or past inflammatory changes, and nothing to suggest the condition known to surgeons as strangulation; in fact, the gut both within and without the sac was perfectly healthy.

The two layers of the appendicular mesentery, on being traced upwards, were found to diverge at the neck of the sac for a distance of about half an inch, and were reflected from the floor of the cavity upon the sides of a small portion of the caput cæcum coli (CC) continuous with a rather larger dilatation (CC) of the same viscus lying within the abdominal cavity. When the band of thickened peritoneum forming the neck of the hernial sac was divided, these two dilatations formed one cavity with no suggestion of subdivision; in other words, the narrowing of the lumen of the caput by the neck of the sac had not resulted in the production of a permanent organic stricture of the tube. The sacculation formed thus by the union of the two pouches above described, lay, when freed from the neck (N) of the sac, to the right of the anterior longitudinal colic muscular band (B), which terminated to the left of the root of the appendix; there was just the faintest trace of a little cæcal pocket to the left of this band.

Treves[1] grouped the varieties of cæcum under four types—

(1) The persistent fœtal cæcum; a conical diverticulum with a tubular prolongation, the appendix vermiformis, hanging from its apex. In this type the three colic muscular bands divide the caput cæcum coli into three fairly equal parts. (2) A variant upon the first type, quadrilateral instead of conical, the apex lying between two bulging sacculi instead of at the summit of a cone. (3) A cæcum in which that part of the caput lying to the right of the anterior band grows disproportionately, while at the same time the anterior cæcal wall develops at a greater rate than the posterior, the apex of the cæcum being thus turned more and more to the left and posteriorly. This form is considered by Treves to be the most usual one. (4) The fourth type is a gross

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[1] "Anatomy of the Intestinal Canal and Peritoneum," London, 1885.

exaggeration of the third; in it the segment of the caput cæcum to the left of the anterior band has atrophied, and the band runs to the inferior angle of junction of the ileum with the cæcum, the appendix appearing to spring posteriorly almost from the ileo-cæcal junction. Five such cæca were met with by Treves.

The cæcum in the present instance occupies a position intermediate in character between the third and fourth types; and I incline to think that, had development proceeded normally, it would have approximated closely to the fourth; the appendicular mesentery, however, by its presence within the sac, has prevented that posterior twisting of the appendix so characteristic of this class of cæcum.

The ascending colon (C) was devoid of mesenterial attachment. The ileum (I), entering the great intestine obliquely from below upwards, was, for the last 2·5 cms. of its course, uncovered posteriorly by peritoneum; the preceding 15 cms. were attached by a short mesentery to the right brim of the pelvis over the iliac arteries and ureter; this mesentery was continuous with the main, and normal, attachment of the remainder of the small intestine.

For some time no trace of a testicle presented itself, it could not be discovered anywhere throughout its abdominal path, and the possibility of its non-descent was considered. The spermatic artery and vein, of very small calibre, were then dissected out at their origin and carefully traced distally; they both left the abdominal cavity behind the neck of the hernia; the vas deferens was next captured at the pelvic brim and followed to the same point of exit; all three structures coursed downwards behind the sac, and terminated in a small nodule about the size of a hazel-nut (T), compressed between the wall of the sac and the dryish skin at the base of the scrotum. This little mass, when softened and dissected, presented none of the characters of an adult testicle, being more a convoluted extremity of the vas deferens than anything else, though from its position and vascular supply there is no doubt that it is the representative of that organ. Atrophy due to pressure and age may possibly have played a part in the production of this state of matters, but even in spite of the fact that the ultimate court of appeal to microscopic investigation is denied, it seems to me more than questionable if this vestigial testicle was ever a functionating structure. The left testicle, I was assured by the dissector, was of normal size and constitution.

Congenital hernia of the appendix and of part of the caput cæcum, of the sort described by me, must be rare,—I can find no example in the literature. From a reference in Erichsen,[1] hernia of the cæcum would appear to be not very uncommon. It is there stated that "Treves has conclusively shown that the view which was at one time held that hernia of the cæcum is usually devoid of a sac, is not true," two out of fifteen of his cases were sac-less, and Bennett has recorded another. "In such cases the peritoneum is supposed to be stripped from the bowel as the latter descends into the hernia" (Erichsen). As there is no textual indication to the contrary, I am led to conclude that the herniæ referred to are acquired and not congenital, even to the extent of having a persistent scrotal pouch of peritoneum ready for their reception.

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[1] "Science and Art of Surgery," vol. ii. p. 824.

On the other hand, Graser, writing on Hernia,[1] mentions that "W. Koch considers that all of these cæcal and large intestine hernias are really congenital." I leave it to surgeons to choose between, or reconcile, the opinions cited. I should myself be inclined to suspect that by noting the position and peritoneal relations of the testicle, it would be possible in most cases of cæcal or appendicular hernia to determine their character, whether acquired or congenital.

The surgical aspect of the case receives further elucidation from comparison with the examples briefly noted in the subjoined table. For this, and for the appended remarks, I am indebted to Dr. Robert Kennedy, Assistant Surgeon to the Western Infirmary, Glasgow. The cases cited are extracted from notes of a large series of herniæ operated upon by Dr. Kennedy, and it is with much pleasure that I here tender my thanks to him for his kindness in so freely placing at my disposal his unpublished records.

No.	Sex.	Age (Years).	Duration.	Contents.	Type of Hernia.
1	Male.	3½	Since birth.	Vermiform appendix.	Congenital.
2	Female.	59	?	Vermiform appendix and caput cæcum. (Strangulated.)	,,
3	Male.	28	14 or 15 years.	Caput cæcum and appendix. (Scrotal, reducible through large inguinal opening, gurgling.)	,,
4	,,	2	Since birth.	Caput cæcum and appendix.	,,
5	,,	30 (approx.)	"Many years."	Caput cæcum and appendix.	,,
6	,,	$\frac{6}{12}$	Since birth.	Caput cæcum and appendix. (Strangulated.)	,,

A most noticeable difference between my case and those of Dr. Kennedy is indicated in the last sentence of his remarks—

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[1] Von Bardeleben's "System of Practical Surgery," vol. iv. p. 492.

"In no case did the attachment of the mesentery descend into the sac." In all likelihood this anatomical peculiarity accounts for the relatively easy success of the surgical interference with the condition.

Cases 2 and 6 of the table offer, of course, an entirely distinct state of affairs. In these, the need for assistance was urgent.

REMARKS.—All the cases in the above table "presented an ordinary hernia on the right side, descending, in the males, into the scrotum, and all having an inguinal opening perhaps rather larger than the ordinary.

"There was rather more difficulty in replacing the contents than is experienced in the case of the small intestine, on account of fixation by the mesentery; but in no case did the attachment of the mesentery descend into the sac."

I feel myself on slightly, but only slightly, safer ground, when I approach this case from the purely anatomical standpoint. I say slightly, because the attempt, for example, to determine anatomically the causes which led to the malformation, or even approximately to date its inception, is a difficult, if not a precarious, undertaking. Adequate data as to the time when any given abdominal organ may be expected to be present in such and such a region are still wanting, and one is forced to fall back upon reasoning from internal evidence, supported at best by deductions from isolated observations. Speaking of cæcal hernia, Graser (*loc. cit.*) says: "If the cæcum, for instance, is found in a scrotal hernia, it is usually possible to reach the gut directly without opening the sac. This can usually be done from behind. . . . These organs maintain the same relation in the hernia to the peritoneum that they normally have in the abdominal cavity." This is partly true in the present instance, though for about half an inch only, below and behind the neck of the sac, could the bowel have been reached without opening the general cavity of the abdomen.

As to the peritoneal relations of the viscera involved, one has only to imagine a cæcum and appendix placed rather farther down than usual in an abdomen furnished with a sac-like evagination at its right lower corner, to picture the existing condition,—the peritoneal relations are practically normal, and the peritoneal covering is similar in both cases.

R. Bruce Young, in a paper[1] upon an "Abnormal Disposition of the Colon," figures[2] the viscera of a fœtus $1\frac{1}{2}$ in. long. At this stage of development (about the end of the second month), the twist round about the neck of the primary intestinal loop has occurred, and, with the superior mesenteric artery as an axis, the cæcum and great gut have revolved towards the right, the cæcum lying just below the liver, but freely provided with a mesentery.

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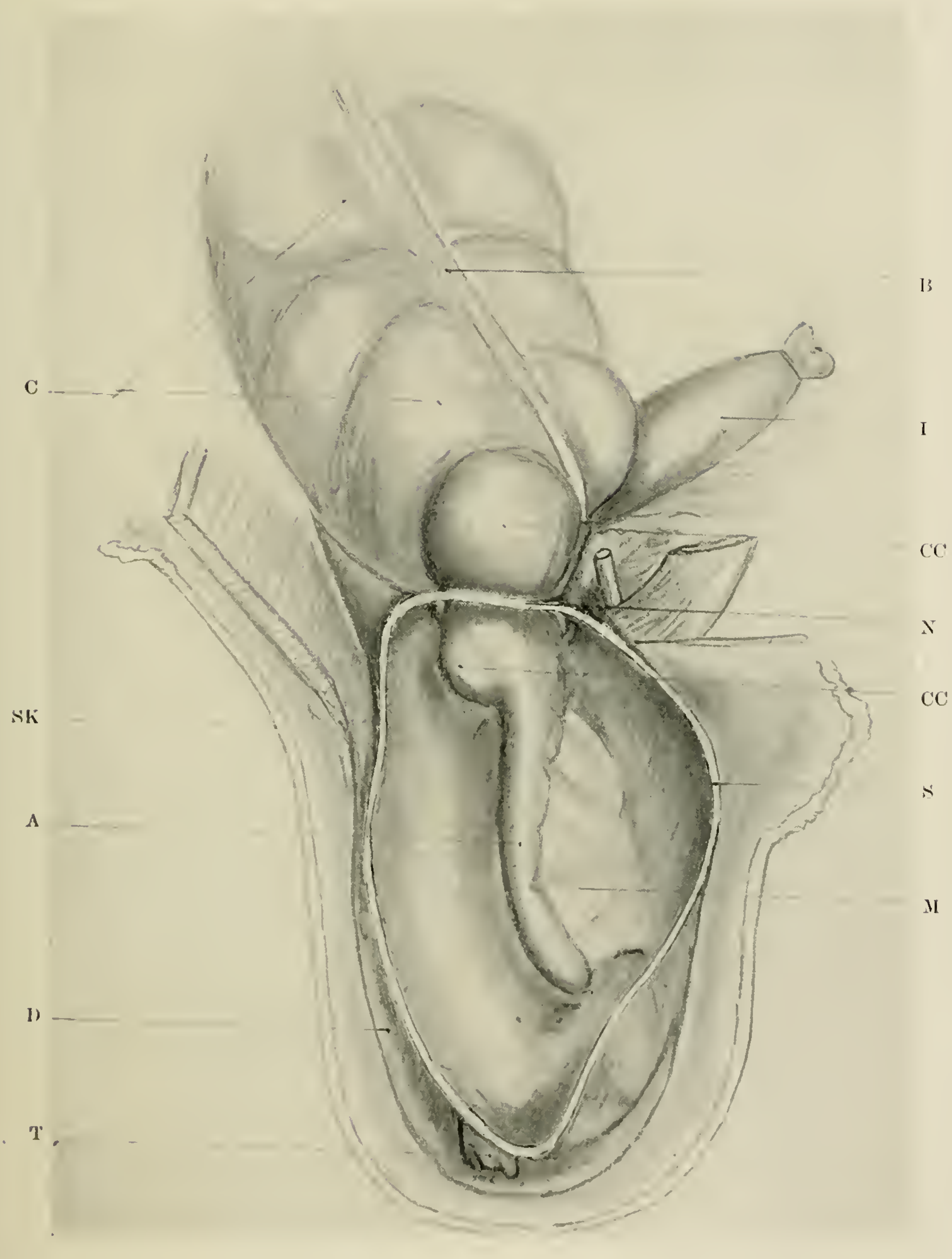
[1] *Journ. Anat. and Physiol.*, London, vol. xix. p. 98, Plate vi^{a} opp. p. 231.

[2] *Loc. cit.*, Plate vi^{a}, fig. 2.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Not until the eighth month (Hertwig) does it occupy the adult position. Now, I fancy that the time taken by the cæcum in attaining its permanent position will depend largely upon the extent of mesentery accorded primarily to the great intestine, and upon the rapidity of the growth of this part of the tube. The cæcum does not move from left to right, leaving behind it a trail of great gut,—the descending, transverse, and ascending colons,—but, as was first insisted upon many years ago by my teacher, Prof. Cleland,[1] the colic portion of the primary intestinal loop is folded over the duodenum, and, should the range of movement be ample enough, may occupy at an early period, as I am led to suppose from my observation of certain peculiarities persisting to adult age, its permanent position, but *provided with a mesentery*; only later, by the increasing growth of the small intestine, becoming denuded of peritoneum to the extent existing in the adult.

Now as to the testicle: during the fifth month this organ is situated a little higher in the abdomen than the inguinal region (M'Murrich). At the same period the cæcum and appendix would normally lie about the upper end of the right kidney; if, however, we postulate for the cæcum of the present case, such a length of mesentery and precocity of development as would, in the fifth month, superimpose it on the testis, we have not, of course, an explanation, but a suggestion of a possible origin of the case discussed. For probably the cause of this condition must be sought in the superimposing at some period of development (not necessarily in the fifth month) of cæcum upon testicle, and it appears not very unreasonable to suppose that the unwonted presence underneath it of the descending testicle may have led to slight adhesion between the cæcal region of the alimentary tract and that organ, which, still passing to its usual site, drew with it cæcum and appendix, the presence later of which in the inguinal canal would not only be adequate to keep open the vaginal process of peritoneum, but by their pressure upon the cord when distended with fæces, would lead to the testicular atrophy which is such a marked feature of this case.

EXPLANATION OF PLATE.

The figure is a drawing of a dissection *in situ*. The bowel is inflated.

S. The cut edge of the wall of the sac. N. Its neck: the deep epigastric artery and conjoined tendon are seen to its right, or inner, side. A. The appendix vermiformis, and M. its mesentery. CC. The caput cæcum coli indented by the neck of the sac. B. The anterior colic muscular band. C. Ascending colon. I. Termination of the ileum. T. The testicle. D. Dartos tunic, etc. SK. Integuments.

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[1] *Journ. Anat. and Physiol.*, London, vol. ii. p. 201 *et seq.* *Ibid.* vol. iv. p. 197 *et seq.*

THE CONTROL OF LIFE.[1]

MANY of Professor Jacques Loeb's scattered papers are well known, but many have been hitherto somewhat inaccessible, therefore every biologist and physiologist will welcome the two volumes in which all his more important *general* contributions have been collected in convenient form. They deal with a great variety of subjects, from heliotropism to artificial parthenogenesis, from regeneration to the physiological effects of ions; but there is a single leading idea permeating them all, the idea, namely, "that it is possible to get life-phenomena under our control, and that such a control and nothing else is the aim of biology." This is one of Loeb's characteristic ideas, that we understand in proportion as we can control. He takes little account of biological theories that do not increase our practical mastery. He is a pragmatist in science. To control animal movements, to make a positively heliotropic animal negatively heliotropic, to make one organ grow in the place of another, to make eggs develop without fertilisation, and so on—these are the tricks which Professor Loeb is so fond of playing. We have come to think of him as a sort of biological conjuror, but with a serious purpose.

In one of Darwin's manuscripts Romanes found the query: "Why do moths and gnats fly into candles, but not into the moon when the same is at the horizon?" To this Romanes said, "The answer must be that the moon is a familiar object, which insects consider as a matter of course, and so have no desire to examine it," for Romanes believed that moths fly to the candle and birds to the lighthouse lamp out of "mere curiosity or desire to examine the new and striking object." But apart from the difficulty presented by the fact that many animals avoid the light, there are many reasons why we cannot accept Romanes's generous suggestion that the creatures which make for the light are incipiently scientific. To Loeb this seems a terrible anachronism; it reminds him of pre-Galilean days, when a body sinking in a fluid "sought its place," to say that animals move toward the source of light "because of curiosity."

When a plant bends towards the light we do not credit it with curiosity; why should we be generous to animals? As the result of a wide series of experiments on Protozoa, polyps, worms, caterpillars, insects, and other animals, Loeb came to the conclusion that "the dependence of animal movements on light is in every point the same as the dependence of plant movements on the same source of stimulation." The orientation of the animal towards the source of light depends on the form of its body; the heliotropic irritability is frequently confined to certain epochs of its existence; the behaviour of the animal depends on the sum-total of its different forms of irritability; the heliotropic phenomena do not depend even upon specific characteristics of the central nervous system. In fact, it comes to this, that instead of talking about "will" and "instinct," or anything that suggests that the creature has "a mind of its own," we must speak of "tropisms."

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[1] "Studies in General Physiology." By Jacques Loeb, Professor of Physiology in the University of Chicago. The Decennial Publications of the University of Chicago. Second Series. Vol. xv. Part I. (pp. 1–423); Part II. (pp. 425–782), many figs. University Press, Chicago; T. Fisher Unwin, London. 1905 Price, 31s. 6d.

But why should we be so ungenerous, why not credit the poor creatures with some volition, misguided as they may be? This sort of question makes Professor Loeb rise up in wrath, brandishing William of Occam's razor—"Entia non sunt multiplacanda præter necessitatem." The "voluntary" movements of animals are always unequivocally determined only by such circumstances as determine also the movements of bodies in inanimate nature. If one says that "instinct" or "will" determines a motion, the true problem is ignored or concealed. If "instinct" and "will" are left out for plants, for swarming Protozoa, for embryos of barnacles, why drag them in when the moth flies to the candle? The answer is plain, that we must leave them out whenever and wherever we can formulate what we observe without having recourse to their aid. But if our formulation in terms of reflexes, irritabilities, tropisms seems an *inadequate* restatement of the facts observed, then we have to fall back on some form of the hypothesis that the living creature has "a mind of its own."

Loeb points out that certain animals, *e.g.*, earwigs, ants, and maggots, are much given to creeping into crevices, and he refers to the zoologist who asked him reproachfully what had been gained by designating as "stereotropism" what had been designated as "instinct." Loeb's answer is that his experiments, *e.g.*, with transparent illumined crevices, and crevices in a perfectly dark room, show that a large number of animals are constitutionally forced to bring their bodies in contact with solid objects on all sides as far as possible. In fact, "stereotropism" or contact-irritability plays a prominent rôle in vital phenomena, *e.g.*, in the entrance of the spermatozoon into the egg, or the migration of leucocytes. To the experimental demonstration of the rôle of contact-irritability no one desires to object, but when we see an ant exploring crevices, one after another, we remain convinced that its behaviour is more than a sum of irritabilities. And Loeb himself admits that "life-phenomena are not dependent solely upon the external causes acting upon the organism at a given moment, but upon these and the conditions present within the organism taken together; and the latter conditions are in themselves variable."

Everyone knows that many animals have the power of regrowing a lost part, but it is not so well known that the part regrown is not always the right part. A polyp cut at the base may grow a head at the aboral end, and a decapitated earthworm may grow a tail in place of a head. In many cases the experimenter can control the result with precision; technically speaking, he can induce "heteromorphoses" at will. If there had been a demand in the market for Tubularians with a head at either end, the Chicago Professor could long since have made a fortune, for he is an expert in making the wrong things grow. The formation of an organ which in form and function is different from that which has been lost, is called heteromorphosis, and Loeb's experiments in this direction are full of interest. One general result is that some animals will not submit to this tampering; with Hydrozoon polyps it is possible to control the position of the new organ, to make bi-apical or bi-basal forms at will, but in the sea anemones a new head is always formed at the original oral edge of the piece, and a new foot at the aboral end. The anemone is more "set" architecturally than the zoophyte stock is.

Another interesting set of experiments shows the possibility of changing positive heliotropism into negative heliotropism, and *vice versâ*, that is to say, of reversing the animal's habitual reaction to light. Loeb worked with the larvæ of acorn shells (*Balanus*), the larvæ of the worm *Polygordius*, and other pelagic animals, and by altering the concentration or the temperature of the sea-water he was able at will to reverse their usual behaviour.

A very suggestive experiment was made with the embryos of a marine fish called *Fundulus*. By means of potassium chloride, a specific cardiac poison in this case, he stopped the circulation of the blood. In spite of this fact, a complete circulatory system was developed, which did not differ markedly, in regard to the direction and the branching of the vessels in the embryo and in the yolk-sac, from that of a *Fundulus* embryo developed in normal sea-water. A complete vascular system, in the main normal, can be formed without a circulation, and therefore without blood pressure!

One of Loeb's speculations rather than experiments concerns the rôle of the nucleus in the cell. It is well known that portions of a Protozoon, excised without any nucleus, may move and show irritability for a short time, but, being unable to feed, they cannot make good their defects, and soon die. The conclusion has been drawn that the nucleus is in some way a trophic centre, that it contains specific formative substances which it gives off to the protoplasm. But the botanists have shown that non-nucleated cell-fragments containing chlorophyll may live for six weeks, being, in virtue of the chlorophyll, able to assimilate and liberate oxygen. This along with other facts led Loeb to the idea that the nucleus is in part at least the organ of oxidation of the living matter. "Fragments of cells without a nucleus are not able to regenerate, because their oxidative activity has fallen to too low a point." And this led him to say: "By cellular structure we understand the fact that there must be a definite maximal distance, variable, however, for different forms and tissue, between the elements of the protoplasm and the nearest nucleus. . . . If the distance becomes too great, the particular protoplasmic element goes to pieces from asphyxiation."

Loeb's most startling experiments are those which deal with "artificial parthenogenesis," that is to say, the artificial provocation of development in unfertilised ova. Working chiefly with the eggs of a sea-urchin (*Arbacia*), Loeb and others have shown that there are many conditions which induce the unfertilised egg to divide into two or four cells,—a slight increase in the alkalinity of the sea-water, an increase in the concentration of the sea-water, treatment with a solution of strychnia salts, and so on. But none of these methods yielded blastulæ, gastrulæ, or larvæ. What Loeb particularly discovered was a method which led on to the production of normal viable Pluteus-larvæ. This consisted in treating the unfertilised egg for two hours with a mixture of about equal parts of a $\frac{20}{8} n$ magnesium-chloride solution and sea-water. The larvæ did not become sea-urchins, but the larvæ produced from normally fertilised ova of this sea-urchin never passed beyond the Pluteus stage in Loeb's laboratory, if indeed in any other.

The question immediately arises, What does the magnesium-chloride treatment really effect? Loeb's general answer is that the treatment brings about a change in the physical conditions of certain colloids in the egg,—a change which *allows* the egg to divide and develop. The change effected during the two hours of treatment is not reversed when the eggs are restored to their normal medium of sea-water. It may be that the spermatozoon brings about a similar change in the condition of the colloids in the egg, either by carrying specific ions into the egg, or by carrying enzymes, or in some other way which is as yet unknown to us. Loeb suggests, in fact, that "in other animals it is perhaps solely the ion constitution of the sea-water or of the blood which prevents the eggs from developing parthenogenetically."

As Loeb's remarkable experiments on artificial parthenogenesis were made with great carefulness, and have been corroborated by other workers, and have been extended from *Arbacia* to other animals (*Strongylocentrotus*, another sea-urchin; *Asterias*, a star-fish: *Chætopterus*, a marine worm), there is no reason to doubt that he replaced one of the normal functions of the spermatozoon by artificial means. We say "one of the normal functions," for Loeb is himself quite clear that besides somehow starting the development of the egg, the spermatozoon has another function, namely, that of bearing the hereditary qualities of the male parent. His experiments have made it easier for us to think of these two functions separately.

But Loeb will not agree to the general opinion that the spermatozoon acts as a *stimulus*; on his view, it is merely an agency which accelerates a process that is able to start without it, only much more slowly. "Substances that accelerate chemical or physical processes which would occur without them are called catalyzers (Ostwald). According to this definition, we may assume that the spermatozoon *carries a catalytic substance* into the egg, *which accelerates the process that would start anyhow, but much more slowly.*" This interesting view has a medical corollary, which it may be relevant to state here.

"The idea that the spermatozoon and the substances which cause parthenogenesis act only catalytically, has a great bearing upon the theory of life-phenomena. It means that if we accelerate the processes of cell-division in the mature egg (by specific catalyzers), the egg can live; but if these processes occur too slowly at the ordinary temperature (as is the case in the unfertilised egg in normal sea-water), the egg dies. The introduction of the catalytic substances which accelerate the processes of development saves the life of the egg. . . . Teratomas may be explained on the basis of the parthenogenetic tendency of the mammalian egg in connection with some chemical change that furnishes the catalytic substance. But it is not impossible that even in benign tumours, such as a teratoma, the catalytic substance may be due to parasitic organisms. . . .

"It is very important to realise that the introduction of catalytic substances into the egg does not prolong its life unless the egg has reached a critical point determined by two sets of conditions. The one is the maturity of the egg, the other the change of conditions connected with the egg leaving the ovary. As long as the egg is immature, it lives without the introduction of these substances or the spermatozoon, and this may be true for the mature egg as long as it remains in the ovary. The fact that there is an age limit for the development of carcinoma may be a similar phenomenon. The catalytic substances which are given off by the cancer parasite may not be able to bring about cell-division in the epithelial cells unless the latter have reached a critical point, which is at least partly determined by the age of the individual."

We have ventured to make this long quotation because it well illustrates that these startling experiments are not mere curiosities of experimental embryology, but have a far-reaching suggestiveness.

But the suggestiveness is even more far-reaching than we have indicated. "We generally consider development as a process which can only occur in one direction, or, in other words, is irreversible." But Loeb's experiments on Hydroids showed that morphogenetic processes of a relatively simple sort *are* reversible. If the polyp of a campanularian is brought into contact with a solid body, it is transformed into undifferentiated material and later into a stolon. If the same organ is brought into contact with sea-water, it gives rise to a polyp again. And Loeb is bold enough to ask how far developmental processes may not be reversible. "It is obvious that in a form with a reversible development death will not necessarily follow a certain stage of development (corresponding to senility in man). It is not impossible that "natural" death is comparable to the situation which is present in the mature egg after it leaves the ovary. Nature has shown us the way by which, at this critical point, death can be avoided in the case of the egg." But the ingenious author does not in these volumes take us further into his confidence. He points his finger towards a possible recipe for not dying, and leaves us wondering.

Time and space fail us to recount all the wonderful experiments with which the heavy volumes are filled. A simple method of producing Siamese-twin embryos, the limits of divisibility of living matter, the definition of a brain, the physiological effects of lack of oxygen, the persistence of reflexes in a sea-squirt from which the only ganglion was extirpated, the normal metamorphosis of axolotl larvæ with an entirely severed spinal cord, and above all the physiological effects of ions,—these are some of the subjects which tempt us. The whole work is interesting, sanguine, and suggestive. After speaking of the importance of studying osmotic pressure and the theory of ions, Loeb writes: "At no time since the period immediately following the discovery of the law of the conservation of energy has the outlook for the progress of physiology appeared brighter than at present. But in order to reap the full benefit of our opportunities, we must bear in mind that the fundamental problem of physiology is the determination of the constitution of living matter, and that in order to accomplish our task we must make adequate use of comparative physiology as well as physical chemistry." This well expresses the spirit pervading these numerous papers.

We have, then, by no means exhausted Loeb's treasury of experimental data, of interpretations and suggestions. But we have said enough, perhaps, to induce many to explore for themselves. Some of the conclusions may be impetuous, and some of the interpretations fallacious,—and we confess that we cannot occupy the general position Loeb holds in regard to the animal organism, being past all hope of giving up the vice of believing in "will" and "instinct," and an irresoluble unity,—but the experiments stand as records of most ingenious device and consummate skill, and their results must be in some way assimilated into the system of biology, whose development is still in many of its parts only beginning. We look both gratefully and expectantly for more light from Chicago.

J. A. T.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

A System of Medicine. By many Writers. Edited by Thomas Clifford Allbutt, M.D., and H. D. Rolleston, M.D. Vol. i. Prolegomena —Infectious Diseases. London: Macmillan & Co. Ltd.

It is now ten years since the first edition of this "System of Medicine" appeared. In that time it has thoroughly established its claim to be considered the standard work on the subject in the English language. The rapid advance of medicine, however, in many of its departments has rendered it desirable to bring this most comprehensive treatise thoroughly up to date, and we learn with pleasure that it is proposed to issue a revised volume annually, thus gradually superseding the original by a second edition.

The volume which lies before us bears ample evidence of the care and thoroughness with which the revision of the whole work is being undertaken. New articles have been introduced, liberal additions have been made to others, while others again have been entirely rewritten. Professor Clifford Allbutt and Dr. J. F. Payne open the volume with a new article on the "History of Medicine." Another new contribution is that of Dr. Francis H. Williams on "X-rays in Medicine," illustrated by a large number of diagrams and photographs. The monograph on the "Medical Uses of Electricity," by Dr. Lewis Jones, has been much extended, and four admirable plates illustrate the position of the motor points. The volume now includes an article by Dr. A. H. Drysdale on the "Clinical Examination of the Blood and its Significance," which will be found most useful, and is, we think, quite rightly included in this section of the work. It is illustrated by an exceedingly good plate in colours. In the original edition the subject of "Fever" was treated by the late Sir John Burdon Sanderson. His "Historical Retrospect" still remains, but the physiological side of the question is now dealt with by Dr. M. S. Pembrey, who has succeeded in producing a most lucid exposition of a very difficult subject. The therapeutic and clinical side of the same subject is admirably discussed by Dr. Hale White, and to the general practitioner this article will be one of the most useful and suggestive in the whole volume. In both these new contributions we are pleased to notice that the old view of the beneficial action of fever is kept well to the front. Dr. Hale White, indeed, quotes statistics which suggest that a high temperature in broncho-pneumonia is, broadly speaking, of more favourable prognosis than a low temperature, and many of us must have had experiences in support of this view. It is beyond all question that antipyretics are still used to a reprehensible extent by many medical men, and it is to be hoped that Dr. Hale White's article may exercise some influence in checking a practice, the evils of which do not seem to be generally appreciated.

The section on "Diphtheria" has been considerably revised. The most striking addition is a short account of intubation by Dr. Stack. There is no doubt that since the publication of the first edition the more general use of antitoxin has given this operation its chance. We nevertheless doubt if it has received the recognition in this country which it undoubtedly deserves. Dr. Stack is obviously an enthusiastic believer in its merits, and we particularly note that he is prepared to trust to it entirely, and has little belief in secondary tracheotomy when there is a difficulty in removing the tube. We agree with him that a comparison of statistics is misleading, but still we would have preferred to see a few figures included to give some rough idea of his results. The rapid change of opinion on this subject is well illustrated by the fact that in the first edition it was stated that the use of intubation was a topic hardly needing discussion. Dr. Herringham has greatly extended his note on the "Serum Treatment of Diphtheria," and has incorporated in it the striking results obtained by this treatment during the past ten years.

The article on "Enteric Fever" by Dr. Dreschfeld has been brought well up to date. Professor Lorrain Smith contributes an interesting section in which the bacteriology of the disease is most thoroughly discussed, and the same writer is responsible for a very complete account of "paratyphoid fever." This condition, which has only recently been recognised, has added a new terror to the already difficult diagnosis of enteric fever. However, it is a comfort to feel that clinically the disease presents no distinction from enteric, and that its importance is therefore more bacteriological than clinical. The articles on "Plague" and "Asiatic Cholera" have been relegated to the section devoted to "Tropical Disease," and will appear therefore in the next volume.

It has been impossible in the limits of this brief notice to attempt to review critically the contents of this great treatise. Many of the monographs would present quite a respectable appearance if published in book form by themselves, and all are worthy of an elaborate review. The proverb, however, that "good wine needs no bush" may be said to be eminently applicable to the whole volume, and the success of the first edition has amply proved its value.

MARTIN, A. (Greifswald), *Die Krankheiten des Beckenbindegewebes und des Beckenbauchfells.* Unter Mitwirkung von AMANN, Jr., Munchen, O. BUSSE, Posen, und PH. JUNG, Greifswald. Berlin: S. Karger. 1906.

IN this volume, Dr. Martin, the well-known gynæcologist of Greifswald, with the co-operation of Amann, Busse, and Jung, has taken up the "Diseases of the Pelvic Connective Tissue and Peritoneum," and thus completed the third volume of a valuable series of gynæcological monographs. In the first and second volumes the "Diseases of the Tube, Ovary, and Parovarium" were considered fully.

In regard to the division of the present work, it may be said that the clinical and therapeutic aspects are in the main taken up by Martin, while the anatomy and pathological anatomy fall to the share of the younger authors.

In the early history of gynæcology, pelvic peritonitis and cellulitis were considered the principal gynæcological diseases, and practically pelvic swellings not uterine or ovarian were regarded as originating in these tissues. The discovery of the importance of tubal diseases threw discredit on these opinions for some time, and some even denied the existence of suppurative pelvic cellulitis at any rate, and urged a tubal origin for the majority of pelvic inflammatory swellings. Time and the many abdominal sections now performed have corrected these extreme opinions, and we are settling down to the task of giving each organ and tissue its fair place in diagnosis. Certainly, pelvic cellulitis, non-suppurative and suppurative, has been shown to be more common than the advocates of the preponderance of tubal disease believed.

In considering the diseases of the pelvic connective tissue and peritoneum, the anatomy is carefully described by Jung, who deals with it thoroughly, and explains the best methods of investigation, by sectional anatomy, injection of the various sites of the pelvic connective tissue, and by dissection. The relations of the ureters and of the lymphatics and lymphatic glands are well described. The histology is also given, especially of the nerve ganglia, and there is a short account of the disturbances of development of the pelvic connective tissue. Altogether the anatomical section is well done, although not so fully as in von Rosthorn's article in Veit's handbook.

We have next a good account of extraperitoneal hæmatocele or hæmatoma, and to emphasise the distinction between it and intraperitoneal hæmatocele the latter is considered separately in a section further on. In extraperitoneal cases the usual expectant treatment is advised, but where the effusion is increasing and anæmia coming on or suppuration occurring, operation is indicated. This may in the former instance be done by a subperitoneal incision or by the suprasymphyseal incision of Pfannenstiel with or without vaginal drainage. When suppuration occurs, vaginal incision and drainage are advised. The section on "Parametritis" is well done, but calls for no special notice. It is fully up to date. Prophylaxis as to sepsis in minor procedures as well as major ones is emphasised. The section on "Gonorrhœal Parametritis" is valuable, Wertheim's view as to the spread of the gonococcus being supported and an interesting case cited, where Krönig in a parametric exudation found the gonococcus the only organism in the lochia. The rare condition of actinomycosis of the pelvic tissue is also described, and about a dozen cases are said to be now known.

On no subject more than that of hæmatocele have our opinions altered since 1866, when Schroeder considered the subject critically. In the causation of the intraperitoneal form, tubal gestation has become a great if not the greatest factor, and several new forms of disturbance by this aberrant pregnancy are now known. All these points receive due attention, and the whole section is a valuable one. Lawson Tait's share in this work is, however, hardly sufficiently recognised, as his operation for ruptured tubal gestation threw the first great light on the question. Imlach and Bland Sutton also deserve credit for their work.

A thorough account of peritonitis and of new growths in the connective tissue concludes a most valuable volume. Martin speaks from a plenitude of clinical and operative experience, and the pathological work of his co-workers is thorough and exact. There are several excellent plates and engravings to illustrate the subject-matter. We feel that in this monograph Martin has increased his reputation not only as an investigator, but as one who can stimulate others to valuable work.

A Handbook of Climatic Treatment, including Balneology. By WILLIAM R. HUGGARD, M.A., M.D., F.R.C.P. (Lond.), H.B.M. Consul at Davos, Switzerland. London: Macmillan & Co. Limited.

THIS is a work of scientific value and much practical interest. The author, who has a special right to speak regarding certain types of climate from prolonged residence at Davos, has evidently made a study of climate in the wider sense.

The work is divided into five parts. Part I. deals more generally with meteorology, and records in a readable fashion the chief facts regarding the composition of the atmosphere, temperature, humidity, pressure, and electricity. Part II. is concerned with the physiology of climate, including the influence of temperature on metabolism, the influence of atmospheric humidity, atmospheric pressure, and light.

The succeeding parts contain applications of the preceding considerations. Part III. deals with varieties of climate and health resorts. The author discusses and sets aside most of the existing classifications of climate, and proposes as the principle of classification, "the demand made by the climate for the production of heat. This corresponds with the demand for tissue change. Other things being equal, that climate is most tonic which demands the greatest amount of tissue change that a given organism can permanently yield." Five groups of climates are admitted:—(1) Climates where the heat demand (or demand for tissue change) is excessively small; (2) climates where the heat demand (or demand for tissue change) is small; (3) climates where the heat demand (or demand for tissue change) is medium; (4) climates where the heat demand (or demand for tissue change) is large; (5) climates where the heat demand (or demand for tissue change) is excessive. Various examples of climate are discussed at some length, including Egypt, South Africa, Algiers, Madeira and the Canary Islands, the Mediterranean, British Isles, United States, Alpine Mountain resorts, and the Ocean. In speaking of the value of climate in tuberculosis, the author concludes that "The stage of the disease, and even extent of it, are comparatively unimportant; and that the chief condition which determines the fitness of a certain climate for a certain patient is the capacity for tissue change, and the general power of nutrition in the patient. The climate that offers the greatest likelihood of improvement or arrest in early phthisis and alleviation in advanced phthisis, is that climate where the patient's nutrition is at its highest level; and this highest level is secured in a cold climate to one patient of high assimilative capacity, while it is secured in a warm climate to another of feeble nutritive power. In any case the climate that makes that demand on assimilative powers generally to which the organism can best respond, is that which will secure the highest resistive power to tuberculous disease."

The chapters on types of climates are perhaps a little unequal; some places receiving disproportionately lengthy consideration, while others are somewhat scantily treated. Thus in the chapter on the British Isles there appears to be no reference to Scotland whatsoever. This is a remarkable omission, considering the extremely high therapeutic efficacy of many parts of the Scottish Highlands. In discussing Alpine mountain resorts, the chief place is given, as is natural in the circumstances, to Davos. Certain other places, such as Leysin, receive less prominence than they are entitled to.

Part IV. discusses baths and mineral waters, and contains much that will be found of sound practical value. Part V. is devoted to therapeutic applications of climate and of mineral waters. This is perhaps the thinnest part of the work. None the less it contains a short and sound statement of the leading indications for the climatic treatment of certain diseases. As a whole, the volume may be recommended as a thoroughly safe guide in the consideration of climatic influences and the selection of a suitable resort for a given case.

Natality and Fecundity: A Contribution to National Demography. By C. J. Lewis, D.Sc., M.D. Edin.; and J. N. Lewis, F.I.A. Edinburgh: Oliver & Boyd.

This is a most valuable contribution to the science of vital statistics, and will form an indispensable part of the library of all who are concerned with natality statistics, whether actuaries, obstetricians, medical officers of health, or any others who are concerned with one of the greatest of social problems.

It is especially fitting that the work should appear in Edinburgh, and should be the work of scientific experts in Edinburgh, as it was in that city that Matthews Duncan made the classical investigation into a portion of the data utilised by the authors of the present work, which was subsequently incorporated in his well-known work on "Fecundity, Fertility, and Sterility." Matthews Duncan utilised the registration returns for the year 1855 of the cities of Edinburgh and Glasgow; the present writers have utilised still more exhaustively the corresponding returns for the whole of Scotland. These returns were at once more complete and less complete than those of subsequent years. This year was the first year of civil registration in Scotland, and there is no doubt that a considerable proportion of births remained unregistered. On the other hand, the information given for registered births comprised not only that now given, but in addition particulars as to the ages of the parents and the number of children previously born to them. Owing to the additional work for the registrars which these additional items implied, the entries were simplified in the following year, and Scotland thus missed having the most complete birth statistics of the United Kingdom, and it is now necessary to go to European countries and Australasia for such information as would have been given in Scotland had the longer schedule been continued.

The work involved in Messrs. Lewis's monograph has been enormous. The results are clearly set forth and carefully tabulated. We can ascertain from the data here given both the fertility and the fecundity according to the age of one or other parent, and can compare those of Scotland with the corresponding experience in European countries and Australia. The problems of initial fecundity, of multiple births, of illegitimate births, of first births, of primary fertility, of order of birth, of average number of children to a marriage, of chronology of births, of masculinity, and of sterility, are all considered in detail, and with the utmost exactitude of statement.

Masculinity is the subject of what is perhaps the most interesting chapter in the book. By this term is meant the proportion of the sexes at birth. The rule is laid down that the possession of a positive masculinity appears to be an integral necessity of a vigorous nationality, the need for the excess of male children at birth arising from the heavier mortality among male children in the early years of life. The relative experience of different countries does not fit in with this rule, for Roumania and Greece are favoured with a masculinity which is much greater than that of the United Kingdom. The masculinity of France again is greater than that of either England or Scotland.

We have said enough to draw attention to the chief contents of this important work, which will be a standard work of reference on the subject for many years.

Text-book of Physiology. By William H. Howell, Ph.D., M.D., LL.D. Philadelphia and London: W. B. Saunders & Company.

The student of physiology is well catered for by the numerous text-books which deal with this subject, and a work issued from the Johns Hopkins school at Baltimore is certain to attract notice. The book is of a convenient size, and runs to some 900 pages; the author, in his preface, states that in its preparation he has tried to keep in mind two principles: first, simplicity and lucidity in the presentation of facts and theories; and, second, the need of a judicious limitation of the material selected. With regard to the first qualification, the book is written in a clear and simple manner, and short historical introductions to many of the fundamental facts and classical discoveries greatly add to its interest. The American method of spelling many English words is rather annoying, and it is still less to one's liking to find the names of living authorities treated the same way—the same name is sometimes rightly, at other times wrongly, spelt. As to the second qualification, no two text-books agree in how much should be included and what should be omitted; some authors specialise on one subject, some on another. A text-book needs to be somewhat dogmatic in its assertions unless it is intended to be a work of reference, and not limited in size. The author has included a large amount of material, but it is well explained and not unduly condensed. The book is not intended for advanced students or for reference by any one specialising in any particular department, but it contains all that is necessary for the average student's requirements. Some references to authorities quoted are given in footnotes, but they are chiefly to papers from which the literature of the subject can be obtained.

The physiology of muscle and nerve is first dealt with, and in this section there is less description of the physics of instruments in common use than one finds in many text-books of physiology. The views on the nature of the contractility of muscle are not those which are universally taught in this country, and Engelmann's hypothesis finds the most favour. The author also accepts Bethe's view that the peripheral end of a divided nerve may regenerate in young animals without a central connection. Head's and Sherren's experiments on nerve regeneration and on sensation had evidently not appeared when the book was written.

The physiology of the central nervous system is very clearly described, and there is a chapter devoted to the physiology of sleep. The special senses are fully treated and illustrated by useful diagrams. Erlanger's apparatus for measuring blood pressure in man is figured and described, as also is the Riva-Rocci apparatus. The chemistry of the tissues is gone into in appropriate sections, and an appendix describes the classification of proteids and their reactions.

There are good chapters on the reproductive organs; Loeb's work on fertilisation of sea-urchins' eggs by physico-chemical means is given; the relation of ovaries to menstruation; the physiology of the placenta; the connection between mammary glands and uterus, and other interesting questions are discussed.

The book is one which can be thoroughly recommended.

Recent Advances in Physiology and Bio-Chemistry. Contributors—Benjamin Moore, M.A., D.Sc.; Leonard Hill, M.B., F.R.S.; J. J. R. Macleod, M.B.; M. S. Pembrey, M.A., M.D.; and A. P. Beddard, M.A., M.D. Edited by Leonard Hill, M.B., F.R.S. London: Edward Arnold.

This book contains a series of essays upon physiological subjects almost entirely of a chemical nature. It includes by no means all the recent advances in physiology, and its title is somewhat general for its contents; the editor, however, states that he hopes, under certain conditions, to edit a subsequent volume, in which other subjects of equal interest and importance may be treated in a like manner.

The first six chapters, by Professor Moore, deal with chemical transformations in living matter, the rôle played by enzymes and cells as transformers of energy, and the various modes in which their action is influenced. The nature of catalysts and enzymes is gone into, and the theories as to their action discussed. There is a very suggestive chapter on secretion and glandular mechanisms, and the influence of the nervous system and of chemical excitants or hormones on secretion is discussed in general, and in particular as exemplified by some of the digestive glands.

The editor writes some very interesting things about the atmosphere, its composition and changes; the effects of barometric pressure, high and low; the cause of mountain sickness; the therapeutic value of mountain air; water and its relation to metabolism, and many other questions involved by these. A large amount of interesting and useful material has been collected together, and is well worth reading by any one engaged in the study of clinical medicine.

The metabolism of fat, carbohydrates, uric acid, and the purin bodies is discussed, and presented from a clinical as well as physiological point of view.

A chapter is devoted to hæmolysins, cytotoxins, præcipitins, and allied bodies, and the "side-chain theory" is explained. Respiratory exchange is fully treated by Dr. Pembrey. The section on internal secretion is very incomplete and superficial, the thyroid and suprarenal glands are taken as types, and no reference is made to some recent work of importance.

Lymph formation and absorption, absorption from the small intestine, the formation of urea, and the secretion of urine, are the other subjects considered.

Some bibliography is given, but chiefly to literature from which further references may be obtained. The book, as a whole, is interesting, but unequal; some of the subjects are not so complete as they might be. The clinical application of much of the work renders it especially interesting, not only to the student of physiology, but also to the clinician, and as such it is to be recommended.

NOTES ON BOOKS.

Anatomy and Physiology for Nurses, by Le Roy Lewis, M.D. (W. B. Saunders & Co., Philadelphia and London), deals with two subjects in which it is not easy to give sufficient information to nurses while avoiding dry and unnecessary details. The anatomy and physiology of the various systems and of the organs of special sense are described in succession. Though here and there one finds in the book technical words used without previous explanation, a nurse will find this a good and useful text-book for the subjects in question.

The twenty-second annual issue of this useful publication—*Year-book of the Scientific and Learned Societies of Great Britain and Ireland* (Charles Griffin & Co. Ltd., London)—contains a record of the work done by various scientific societies during the session 1904–5. It not only keeps up the high standard attained in previous years, but, if anything, will be found even improved in the extent and accuracy of its contents. It is a volume which no library or society should be without.

As usual, this annual record—*Transactions of the Clinical Society of London*, vol. xxxviii. (Longmans, Green, & Co., London)—contains a large amount of interesting matter; specially commendable, also, is the brevity and conciseness of the papers—a feature too rare in medical writing. Space forbids the enumeration of many of the titles, but among the articles which struck us as particularly noteworthy, Keyser's paper on

Sprengel's deformity of the shoulder, Box's description of the syndrome of posterior basic meningitis occurring in adults, or children whose skulls are consolidated, and the articles on rheumatoid arthritis by Hale White and Abraham, may be mentioned. Wallace and Fagge deal with the surgical treatment of intussusception; their results confirm the superiority of laparotomy to non-surgical procedures. Among the rarities of medicine which figure in these pages we should include Marsh's case of malarious affection of the knee, the case of typho-pneumonia described by Phillips; nor must Taylor's case of non-fatty chylous ascites be omitted. The Transactions are a record of a useful session's work.

The cosmopolitan authorship of this volume—*International Clinics*, series 15, vol. iii. (J. B. Lippincott Co., Philadelphia and London)—may be gathered from the fact that it contains contributions from the pens of American, Austrian, Canadian, English, French, and Scottish specialists. Taken as a whole, the volume scarcely reaches the high level of merit which, under Dr. Kelly's able management, this quarterly has attained, but, nevertheless, almost every one into whose hands it may fall will find something of interest in one of the eight sections—Treatment, Medicine, Surgery, Neurology, Dermatology, Rhinology, Ophthalmology, Pathology—into which it is divided. Papers on therapeutics are a specially strong feature of this issue, the place of honour being given to a long article on radio-therapy, which is followed by two papers on quite new topics, namely, the action of "metallic ferments," as the writer, Professor Robin, terms solutions of metals in an infinitesimal state of division, and on the effects of the formiates, by Huchard. If Robin's researches on metals should be confirmed, it is scarcely too much to say that a new therapeutic vista will be disclosed, while in the formiates it seems as though we shall find drugs with great musculo-tonic and diuretic virtue. The articles on medicine call for no special mention. Of those on surgery, Wight's paper on fracture of the patella is a useful contribution to a much discussed subject, while Luke's practical paper on ethyl chloride anæsthesia will be read with interest; eight deaths from the anæsthetic are quoted, and collected observations give a mortality of 1 in 12,000 to 17,000. Among the remaining articles may be noted Dr. W. G. Sym's note on metastatic gonorrhœal conjunctivitis, and that of Sanger Brown on the invasion stage of acute anterior poliomyelitis.

A great deal of sound advice is given in the seventy odd pages of which these notes consist—*Notes on General Practice*, by S. M. Hebblethwaite (The Scientific Press Ltd., London). Any newly fledged graduate who reads Dr. Hebblethwaite's book will find in it a bridge from the hospital practice with which he is acquainted, to the private practice in which he is so often doomed to learn that much of his hardly acquired knowledge is but vanity. The only doctrine to which we would take exception is one contained in the paragraphs on the rearing of infants, because we fear that it may help to perpetuate the use of that lethal weapon, the long-tube feeding-bottle.

This short monograph—*The Diagnosis of Tuberculosis of the Lung*, by Dr. K. Turban; translated by Egbert C. Morland (John Bale, Sons &

Danielssen Ltd., London)—is issued with the imprimatur of a commendatory introduction by Sir Dyce Duckworth, but, even apart from this, its intrinsic merits would have recommended it to all interested in the early diagnosis of phthisis. Dr. Turban is the director of the Sanatorium at Davos Platz, and has therefore the right to speak with authority. He is a strong exponent of the thesis that tubercle is recognisable before bacilli can be found in the sputum, and, in this respect, his book is an admirable corrective to those who would hastily exclude phthisis because of a negative bacteriological report. The chief feature of the book is the extraordinarily minute and painstaking account of the physical signs of early lung disease; few will be able to read this without a sense of shortcoming in the face of the author's high standard of exact description. It must, however, be confessed that this part of the book, chiefly from an unfamiliar nomenclature, is a little difficult to follow. Heavy percussion is deprecated as unreliable; and "rough breathing," which seems to be a subdivision of what here we term "harsh vesicular," is looked on as one of the chief signs of early mischief. The tuberculin test in Dr. Turban's hands has been devoid of danger; a novelty on the same lines is the administration of a dose of iodide of potash, which, by setting up a transient catarrh, may render apparent a latent patch of tubercle. The translation is unusually well done, but on page 15 the sense of a sentence is a little obscured by the not uncommon mistranslation of the German "erst" as "first," instead of "only," as it should be rendered in this construction.

The Pathology and Treatment of Rheumatoid Arthritis, by P. W. Latham, M.D. (Deighton, Bell, & Co., Cambridge), reprinted with additions from the *Lancet*, is a lucid and cogent argument in support of the neural theory of rheumatoid arthritis, and as such is an interesting contribution to the pathology of this most obscure malady or group of maladies. While it would be rash to admit that Dr. Latham has proved his point, his theory, as a working hypothesis, leads to a practical outcome in the treatment, by cupping and blistering, of the spinal congestion or chronic myelitis from which the joint troubles are supposed to originate. The benefits of this treatment are shown by illustrative cases.

This lucid and instructive contribution—*Mouches et Choléra*, by A. Chantemesse and Frédéric Borel (J. B. Baillière et Fils, Paris: Les actualités médicales)—to the epidemiology of cholera contains an historical summary of the outbreaks of the disease from the beginning of the nineteenth century to the present day. From a critical survey of the facts the writers infer that the two main factors in the spread of the disease are the presence of individuals who harbour the comma bacilli without themselves being attacked, and the transmission of infection from dejecta to food by flies.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Diseases of the Digestive Organs.

Carcinoma of the Rectum: Early Diagnosis and Medical Treatment.—Papers on this malady from the pen of a physician are not numerous, hence Boas' article (*Arch. f. Verdauungskrankh.*, Berlin, 1905, December 18), which is based on a study of 83 consecutive cases, merits attention. *Forerunners of rectal cancer.*—Among many antecedent conditions, two only—habitual constipation and hæmorrhoids—occurred so frequently as to appear to predispose to the disease; piles were present in more than a quarter of Boas' cases. *Initial symptoms.*—In many cases the classical triad—tenesmus, alternating constipation and diarrhœa, and blood in the motions—was the earliest sign of disease, but in not a few instances the onset was quite different. Severe colic with attacks of distension, and pain in the sacral region, often mistaken for rheumatism, seem not infrequently to precede other local symptoms. The classical symptoms are not always combined. Hæmorrhage may occur alone, and in the early stage is often as profuse as that of piles. Tenesmus is the most characteristic symptom, but it must not be supposed that it invariably points to organic mischief, for a purely nervous type may exactly simulate that of cancer, uterine tumour, etc. The tenesmus of piles is less persistent, and may remain absent for weeks at a time, which is seldom the case in cancer. In about two-thirds of all cases tenesmus is an early symptom; in the remainder, it does not occur until the malady is well advanced. *Course.*—The malignity of rectal cancer is very variable; in more than a quarter of Boas' cases the tumour had advanced so rapidly within three months as to be inoperable; on the other hand, several cases which had gone on for two or three years were yet favourable for radical operation. *Diagnosis.*—Failure to recognise cancer is due—(1) To the symptoms being either latent or of such a nature that the patient ascribes them to piles; and (2) to delayed rectal examination. Another misleading feature is the ruddy, healthy appearance of many patients, and the fact that they rapidly gain weight on a fattening diet. Among symptoms which ought at once to suggest a digital examination, Boas mentions a slight putrid, not fæcal, odour hanging about the clothes, even in perfectly cleanly people. Again, the patients often state that, while they suffer from diarrhœa, each movement of the bowels lasts a very short time—is "a mere squirt." Moreover, they tell you that the diarrhœa goes on despite dietetic and medicinal treatment, *i.e.* it is false diarrhœa, due to constipation. Along with chronic diarrhœa of this nature the urinary indican is high. In cancer high up, which is difficult to feel, Boas strongly recommends the speculum, and, if need be, the removal with forceps of a small piece of tissue for microscopic examination. *Complications.*—These are common and usually accidental. Only two occurred with any frequency—metastasis to the liver in seven cases, and diabetes mellitus in five. The proportion of the latter is unduly high, and as it preceded the cancer, Boas suggests that the abnormal diet may have had something to do with the growth of the tumour. *Medical treatment.*—This is important, because nearly 80 per cent. of all cases come, first or last, into the hands of the physician as inoperable; it is also important, because the disease is relatively benign and amenable to palliation. The three indications are—(1) Preserve nutrition, (2) maintain a free passage, (3) avoid irritating the tumour. It is not advisable (as is often done) to put such patients on a "light" diet. The food should be mixed, and should contain rather an excess of nitrogen, as well as plenty of fats of all kinds, even those which are comparatively difficult of digestion. It is, in fact, very much the ordinary diet of health. Abundance of sugar, which prevents constipation, ought to be included, and vegetables may be freely given, provided they are well chopped or pounded. The only real restriction of diet is to forbid salads, edible roots (*Wurzel-gemüse*), uncooked fruit, and generally food having hard residue, such as rind, scales, etc. As far as possible, the food ought to be given in the form of *purées.* Wines and beer should be avoided, especially if there is hæmorrhage. Many articles commonly excluded as indigestible, such as beans and peas, and acid foods, need not be barred. The best test that such a diet is suitable is furnished by a diminution of the tenesmus. The diet selected is very much that which is employed in chronic constipation. As a rule, *aperients* are also required: the best are mineral waters, castor-oil, rhubarb, magnesia, and salines. Boas regards enemata as harmful; they are irritating, and only remove fæcal masses which have already passed through the stricture, for which purpose small injections of oil are sufficient. Tenesmus is best relieved by suppositories of codeine, heroin, or morphine, with belladonna. Means of checking hæmorrhage are unreliable; adrenalin or hydrogen peroxide may be tried. Palliative surgical operation (colostomy) should be postponed as long as possible by these medical measures.

Boas is of opinion that an earlier diagnosis of this and other varieties of cancer can only be attained by instructing the public in the first signs of the disease. One of his suggestions as to how such knowledge may be disseminated is at least novel—that the symptoms of cancer might be printed on the back of prescription forms!

SCHMIDT'S METHOD OF TESTING THE GASTRO-INTESTINAL FUNCTIONS (Roux and Riva, *Gaz. d. hôp.*, Paris, 1905, June 17).—The principle underlying this method consists in giving to the patient, for two or three days, a diet which normally leaves very little residue in the fæces; then, by examining the stools, discovering which of the digestive functions is at fault. Such a diet is as follows:—*First breakfast.*—Half a litre of milk or cocoa, and 50 grms. of rusk. *Second breakfast.*—Half a litre of oatmeat gruel, made with butter, milk, and an egg. *Dinner.*—125 grms. under-done minced beef, cooked with butter, and double the quantity of potato *purée*. *Tea.*—Half a litre of milk. *Supper.*—Like second breakfast. The essential constituents of the diet, from a diagnostic point of view, are the cereals and the under-done meat. This diet must be taken for three or four days; some colouring matter (charcoal) may be added to show when it is beginning to affect the stools. The fæces are well diluted with water, and a small portion is then examined for solid particles of food, bile, and blood. (1) *Mucus.*—Membranous shreds of mucus (apart from the large masses found in muco-membranous colitis) are frequently detected. These are always abnormal, and originate in the colon. Flakes of mucus from the small intestine, recognisable by their yellow colour, are much less common. Mucus is found in the stools chiefly in constipation, especially when masked by irritative diarrhœa. (2) *Residue of connective tissue and muscle fibre.*—The former is digested by the stomach alone, the latter by the gastric and intestinal secretions. Normally, no connective tissue, and only a few partially digested fibres of muscle, should be discoverable in the fæces. The presence of the former, therefore, implies inadequate gastric digestion, either (most commonly) from hypochlorhydria, or from the too rapid transit of the gastric contents into the duodenum. (3) *Carbohydrate residue.*—On the above diet the only starch débris normally found in the motions is a little residue of potato; larger quantities of carbohydrates signify defective secretory activity of the small intestine or deficient absorption of starch. Schmidt has described, under the name "intestinal dyspepsia with fermentation," a clinical type characterised by colic, slight diarrhœa, and malnutrition, in which the motions contain quantities of starch, but no abnormal content of fat or proteid. (4) *Fats.*—These are always found in considerable amount, either as globules, crystals of fatty acids, or soaps. Excess of fat can only be estimated roughly, *e.g.*, by Nothnagel's method, which consists in examining a specimen of fæces under the microscope, and noting the degree of alteration in appearance produced by adding a drop of ether.

Schmidt's method has also been tested by Steele (*Med. News*, Phila., 1905, December 16), who finds it less useful as a means of diagnosis than in determining the proper diet in a case of gastro-intestinal disease. His paper brings out the following additional points. Three, and sometimes four, chemical tests may advantageously be employed as well as microscopic examination. (1) The reaction should be tested by adding a drop or two of dilute fæces to litmus solution. (2) Sublimate test for bile. Shake the liquid fæces with saturated mercuric chloride, whereupon a normal stool yields a pinkish colour, one containing bile a greenish hue. (3) Fermentation test. Normally little or no gas is evolved; if one-third of the tube be full of gas after twenty-four hours, and the reaction of the fluid be acid, there is abnormal carbohydrate fermentation; if the fluid be alkaline, albuminous fermentation has occurred. Bile indicates a too rapid passage through the intestine; fragments of meat mean a disturbance of the function of the upper part of the gastro-intestinal tract; pathological fermentation of albumin means a large remainder of albumin in the fæces, and indicates a serious condition—usually an anatomical change in the mucous membrane of the small intestine. Steele also describes Koziczkowsky's method of quantitatively estimating the albumin of the fæces, which is expected to aid us in detecting insufficient albuminous digestion and absorption.

Chylous Ascites has been the subject of several recent papers, from which it is evident that the pathology of milky effusions not due to chyle still requires elucidation. Boston (*Journ. Am. Med. Ass.*, Chicago, 1905, February 18) gives as the marks by which *true chylous effusions*—*i.e.* those due to transudation of chyle from blocking of the ducts—may be distinguished from *chyliform effusions*, which owe their milky appearance to granular degeneration of their cellular contents—(1) That chylous effusions consist of a fine emulsion of fat globules, contain few cells, give the reaction for sugar; while (2) chyliform effusions are cellular, contain no sugar, and separate into a creamy layer on standing. True chylous effusions may vary as to the odour, amount, and melting point of the fat, according to the diet for the time being. He reports a case with eosinophilia of 25 per cent. the ascites being due to obstruction of the chyle channels by tuberculous peritonitis. A classified table of 126 cases is given. Nichols (*Med. News*, Phila., 1905, November 11) reports chylous ascites complicating cirrhoses of the liver. The mechanism was in his case rather peculiar. Besides the ordinary collateral circulation, the obstructed blood flow had tried to find a way by the veins of the mesentery and lymphatic glands. Rupture of a vessel had taken place into a lymph sinus, with the production of a thrombus spreading up the lymphatics to the receptaculum chyli. Bell (*Am. Med.*, Phila., 1905, May 27) records a case of true chylous ascites due to rupture of some part of the lymphatic system; the remarkable feature is the enormous quantity of chyle withdrawn by tapping—272 litres in eight months—with little loss of weight or strength. The chemical aspects of the question are fully discussed; according to Beebe, who is responsible for the analysis, while the presence of sugar proves that an effusion is chylous, its absence does not prove it to be merely chyliform. Wilson (*Am. Journ. Med. Sc.*, Phila., 1905, October) points out that while chylous effusions are due to transudation of chyle from obstruction, injury, or disease of the lymphatics, and chyliform effusions to diseases which produce fatty degeneration of cells, especially of endothelium, such morbid processes as cancer, tubercle, cirrhosis, etc., may act in both ways, hence many milky fluids partake of the nature both of chylous transudates and chyliform exudates. He records a case of this nature in a patient suffering from retroperitoneal and thoracic sarcoma with milky pleural and peritoneal effusion. The fluid contained numbers of fine granules (fat) and degenerated epithelial cells, while post-mortem there was evidence both of transudation from the lymph passages, and fatty degeneration of the endothelium of the serous membranes. Taylor (*Trans. Clin. Soc. London*, 1905, p. 169) reports a case of chyliform ascites of different nature from any of the preceding. The cause of the effusion was not explained by the autopsy. The fluid owed its lactescent appearance neither to chyle, nor to cells, but to an albumin. Lactescence due to proteid has of late years been variously ascribed to lecithin, to a mucoid body, and to a substance resembling casein. In Taylor's case all the proteid was in the form of albumin; no ferment was present.

SURGERY.

UNDER THE CHARGE OF

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Intraneural Injections of Antitoxin in the Treatment of Tetanus.

It must be admitted that the tetanus antitoxin has hitherto disappointed the hopes that were raised when it was introduced by Tizzoni in the early nineties. Recent experimental work by Meyer and Ransom (*Arch. f. exper. Path. u. Pharmakol.*, Leipzig, 1903), and by Marie and Morax (*Ann. de l'Inst. Pasteur*, Paris, 1902–03), supplemented by certain clinical observations, seems to indicate that better results may be expected from the injection of the antitoxin directly into the nerve trunks, or into the spinal cord. An admirably clear summary of this work is furnished by E. W. Archibald of Montreal (*Montreal Med. Journ.*, 1905, December), from which we quote. It has long been known that the bacillus of tetanus remains entirely at the seat of infection, and there manufactures its toxins, which being absorbed give rise to the phenomena of the disease. These toxins attack principally the spinal cord, and, up to the year 1901, it was believed that they travelled thence in the lymphatics and by the blood. In 1903, in the paper above referred to, Meyer and Ransom demonstrated that the only path of transport for the toxin to the central nervous system is by the nerve. By a series of ingeniously devised experiments, Marie and Morax have shown that after subcutaneous inoculation of the toxin it can be demonstrated in the nerve, although it is absent from other organs. They show further that the sucking up of the toxin by the nerve is bound up with the integrity of the axis cylinders, because by a divided nerve in which the axis cylinders were degenerated no toxin was absorbed. It is also found that the toxin gets into the nerve, not by the neural capillaries, but by the bare axis cylinders ending in the muscle; and that it only travels centripetally. This seems to suggest that there must be a current of protoplasm running constantly up the axis cylinder to its central cell, and that it is this current which carries the toxin. By other experiments, from which apparently all fallacies were excluded, it has been shown that the spinal centres can be protected from the toxin by "blocking" the afferent nerves with antitoxin.

Thus, for example, a rabbit received the toxin in the right and left legs over the tibia subcutaneously; at the same time antitoxin was injected into the sciatic of the right leg, which remained free of tetanic stiffness, while the left leg became tetanic. It has also been found that the ascent of the toxin can be prevented by cutting the cord. If the toxin be injected directly into nerves, much more acute and severe consequences follow than when it is injected into a vein or into the subcutaneous tissue, and tetanus develops more quickly. These and other experiments throw light on the incubation period of tetanus. When the toxin is injected directly into the lumbar cord, tetanus develops with extraordinary rapidly (two to four hours); while, when the toxin is injected into the legs, the incubation period is usually from two to three days. The conclusion drawn is that "the greatest part of the incubation period is used up in the transport of the toxin along the peripheral nerves, from the nerve endings in the muscle to the cord centres." In animals, it is found that the tetanic symptoms always begin with stiffness of the limb into which the injection has been made, and Archibald has observed a similar condition in human subjects. This phenomenon is easily understood if the toxin travels only by the nerves.

Meyer and Ransom believe that the toxin travels to the cord only by the motor path; it never reaches the cord by the sensory nerves; and that the "pain apparatus" of the cord is isolated from the motor, so that the poisoning of one does not spread to the other. The first effect of the toxin on the motor ganglia of the cord is to put them into a state of hyper-excitability, so that they are aroused by the stimuli which are continually streaming in from the sensory periphery, and which ordinarily remain latent so far as exciting motor action is concerned. These stimuli are now sufficient to cause a continuous discharge of energy, much greater than the ordinary, sufficient indeed to bring the muscle into contraction, in spite of central inhibition. As the toxin accumulates, the reflex arc is affected, and there is reflex hyper-excitability, so that when a stimulus arrives an abnormally severe motor explosion takes place, and spreads by ascending and descending collaterals to the reflex apparatus of the whole cord. If the toxin spreads, we get both motor hyper-tonus and hyper-excitability, so that there is stiffness of almost all the voluntary muscles, together with general reflex hyper-excitability—the tonic contraction and the clonic spasms characteristic of tetanus.

As regards the application of these facts to the antitoxin question, it is evident that they have an important bearing on the time and method of introduction of the antitoxin. Meyer and Ransom suggest that the antitoxin does not follow the toxin in the nerves to the central nervous system, and therefore cannot protect the animal from toxin already absorbed by the nerves; nor does the antitoxin appear to reach the central nervous system even by way of the blood and lymph. These observers are of opinion that antitoxin injected subcutaneously or intravenously is never taken up from the blood and lymph by the substance of the nerve fibres or the ganglionic cells. Even in an animal whose blood is antitoxic to the last degree, the neurones are free from antitoxin, that is, are unprotected. That part only of the toxin which is circulating in the blood can be reached and rendered inert by antitoxin injected subcutaneously. That portion of the toxin which is already in the nerve substance or in the cord can no longer be overtaken by the antitoxin. An infection depending upon toxin already absorbed by nervous tissue, therefore, will inevitably run its course. It is conceivable, however, that if a lethal dose of toxin has been absorbed by the nerves, but has not yet reached the spinal cord, a fatal ending might be averted by the injection of antitoxin into the nerve substance—in other words, we must block the advance of the toxin before it has time to reach the vital centres in the cord.

The clinical evidence as to the value of intraneural and intramedullary injections of antitoxin is as yet meagre, but, so far as it goes, it raises hope that something may yet be done to avert the fatal issue in some cases. Küster, Hertle, Braun, and Kocher (*Proc. German Surgical Congress*, 1905) have tried the method, and speak hopefully of it. Rogers (*Journ. Am. Med. Ass.*, Chicago, 1905, July 1) reports seven cases in which he has employed it, with encouraging results. Archibald used it in a case of tetanus following vaccination, without, however, saving the patient. In view of the otherwise fatal nature of acute tetanus, he is inclined to recommend that the antitoxin should be injected into the nerves of the affected part, into the spinal cord, and into the cerebral tissue, and in all cases the injections should be made early.

Stovaine as a Local Anæsthetic.

The claims of this new anæsthetic are supported by Paul Reclus (*Presse méd.*, Paris, 1906, January 3). He does not use the drug in combination with adrenaline; nor does he admit that stovaine has any marked vaso-dilator action. He acknowledges that with cocaine there is less bleeding during the operation, but with stovaine, he says, the hæmorrhage is not greater than would occur in cutting through the healthy tissues. The drug is soluble in water, and can be perfectly sterilised by heat. With solutions of ½ to 1 per cent. he has never seen gangrene of the skin, or sloughing of the edges of the incision. When these accidents occur, he says, it is due to solutions of 5 or 10 per cent. having been used. He admits that, while being injected into or under the skin, ½ to 1 per cent. solutions sometimes cause a slight burning sensation. He has found ½ per cent. solutions best for mucous membranes — for example, in piles. The results of comparative observations on the relative anæsthetic properties of cocaine and stovaine in solutions of equal strength have been conflicting. In cases of varicose veins, for example, where one part of a vein has been excised under cocaine and another part under stovaine, in some patients the former was more satisfactory, in others the latter. On the whole, he considers that the analgesia produced by stovaine is less extensive, less complete, than that produced by cocaine, and that it is longer of appearing, and passes off more quickly, so that sometimes the patient feels the prick of the needle in closing the wound. It is, however, incontestable that stovaine is less toxic. From 40 to 60 cgrms. of a ½ per cent. solution may be used; doses of 20 to 30 cgrms. are absolutely safe.

Having performed about 1000 operations under stovaine, Reclus feels able to express an opinion as to its value compared with cocaine. The cocaine anæsthesia, he says, is more equal, more sure, more extensive, it comes on more rapidly and lasts longer, but it is less safe, as even with moderate doses there is some pallor of the face and slight cerebral excitement, symptoms which do not occur with stovaine. With both drugs any operation should be performed with the patient horizontal.

THE TREATMENT OF ACUTE INFLAMMATORY CONDITIONS BY BIER'S PASSIVE CONGESTION.

FROM an experience of 105 cases of acute inflammatory affections treated by passive congestion, Danielsen (*München. med. Wchnschr.*, 1905, November 28) speaks very highly of the method, and confirms the opinion of Bier that it possesses the following advantages: it obviates the necessity for large and painful incisions; small punctures are usually sufficient to let out pus, and these can be performed under chloride of ethyl anæsthesia; the packing of wounds is not necessary, and pain is thereby avoided; in affections of joints and tendons, function is conserved; the time required to bring about cure is materially shortened; and disfiguring scars are avoided. He has employed the method in the treatment of cellulitis, boils, carbuncles, etc., following the directions given by Bier.—See also *Edin. Med. Journ.*, 1905, June.

THE TREATMENT OF GENERAL PERITONITIS.

IN a paper on this subject read at the Congress of the International Society of Surgeons at Brussels, M'Cosh of New York (*Med. News*, N.Y., 1905, November 4) divides cases of generalised peritonitis into two classes—(1) Those in which the patient is in a desperate or moribund condition; and (2) those in which the patient is critically ill, but not moribund. In the first class the prognosis is hopeless, and operation is only calculated to hasten the fatal issue, and is apt to bring discredit upon surgery. His observations refer to cases of the second class, and particularly to those in which the peritonitis is due to appendicitis. M'Cosh points out that within recent years the tendency to operate indiscriminately in all cases of this class has diminished, and that a considerable number of surgeons are now inclined to abandon this attitude. He is among the number; and to illustrate his position he states that whereas ten years ago he was in the habit of operating in 80 or 90 per cent. of all cases encountered, he now operates on only about 50 per cent. He has often been agreeably surprised to see patients pass through the critical stage of their peritonitis to a condition where there remains but a localised abscess, in the midst of which lies a gangrenous appendix. The author confesses to the difficulty, in many cases, of deciding whether or not to operate. In general terms he expresses the opinion that "the chances of recovery for elderly patients, especially if they have led dissipated lives, are diminished if they be subjected to operation." For these the best treatment is absolute starvation, gastric lavage, and small saline enemata. "On the other hand, youthful patients should, as a rule, be subjected to immediate operation."

As regards the operation, M'Cosh favours a general anæsthetic, preferably chloroform, or a mixture on an open mask. A short incision along the outer edge of the rectus is generally the most convenient. In generalised peritonitis, irrigation with a normal saline solution, at a temperature of 110° F., is at once begun, and is continued during the subsequent stages of the operation. The saline solution is also useful as a stimulant, as a considerable quantity is absorbed. Mechanical irritation, such as must result from sponging or rubbing the peritoneal surfaces, is injurious. Drainage is essential, and is best effected by means of the "cigarette drain." Tamponades of gauze are disadvantageous, as they are apt to interfere with proper intestinal peristalsis, and may even cause obstruction. The author is opposed to multiple drainage openings, and to post-operative irrigation. Evisceration of intestines should, as a rule, be avoided. Adherent patches of lymph on the peritoneal surfaces should not be disturbed. Enterotomy, with "milking out" the contents of a stretch of intestine, is sometimes of benefit, but a temporary enterostomy is seldom to be recommended. Gastric lavage is often useful. The injection of magnesium sulphate, by means of a hypodermic syringe, into the intestine has in some cases been beneficial. The author strongly favours the elevation of the head of the bed during the after-treatment.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Cæsarean Section.

Olshausen (*Centralbl. f. Gynäk*, Leipzig, 1906, No. 1) reports the results of 118 sections. The indications were—Contracted pelvis, 91; eclampsia, 7; myoma, 6; carcinoma uteri, 4; vaginal fixation, 4; nephritis, 2; heart disease, 2; cicatricial contractions of cervix and vagina, 2. Of the pelvic contractions 71 were rickety. Generally contracted pelvis, 4; obliquely contracted pelvis, 4; transversely contracted, 1; pseudo-osteomalacia, 2; scoliosis, 3; kypho-scoliosis, 1; tumours of pelvis, 2. In some of those the operation was performed more than once. With reference to the eclampsia cases, Olshausen has performed vaginal Cæsarean section twelve times, with three deaths; and the classical operation seven times, with two deaths. With regard to the technique, he recommends that the abdominal incision should be made as high as possible, and terminate about 8 cms. above the symphysis pubis. The uterus is turned out of the wound, which is brought together at its upper part. The position of the placenta can be ascertained by noting the situation of the largest veins on the exposed uterine wall. He further recommends the giving of ergotin twenty minutes before the operation is begun. For ligatures he prefers catgut to silk, as the latter cause fistulæ. Of the ninety-one operations for contracted pelvis, there were nine deaths.

FATAL INTRA-PERITONEAL HÆMORRHAGE IN UTERINE MYOMATA.

STEIN (*Monatschr. f. Geburtsh. u. Gynäk*, Berlin, Bd. xxii. Heft 5) reports the following case:—P., æt. 39, was admitted to hospital in a collapsed state, with the history of abdominal pain. Her condition pointing to internal bleeding, she was at first treated by saline infusions and camphor injections. Although greatly collapsed, it was decided to open the abdomen, as a provisional diagnosis of ectopic gestation was made. There was found, however, much free blood in the abdomen, and two myomata, on one of which the veins were very much distended. The uterus was removed by supra-vaginal hysterectomy. The patient died forty hours after operation, and at the post-mortem a lacerated vein was discovered to be the cause of the hæmorrhage. Only two similar cases have been reported.

INTRA-PERITONEAL HÆMORRHAGE, DUE TO THE RUPTURE OF A HÆMORRHAGIC CYST OF OVARY.

BENDER and Marcel (*Bull. et mém. Soc. Anat. de Paris*, 1905, July) report the following case to show that effusions of blood into the female pelvis may be the result of other conditions than ectopic gestation, which is doubtless the most frequent cause of hæmatocele. P., æt. 26, admitted to hospital with all the signs of internal hæmorrhage. A history of delayed menstruation, followed by irregular hæmorrhagic discharge and sudden onset of abdominal symptoms, pointed to ectopic gestation as the most likely cause. Operation, however, showed both tubes normal, and no evidence of gestation products. A small thin-walled hæmorrhagic cyst was found in the left ovary, which had ruptured and caused the extensive hæmorrhage into the peritoneal cavity.

INVERSION OF THE UTERUS.

FREIDMAN (*Journ. Am. Med. Ass.*, 1905, December 23) suggests the term "initial" instead of "partial" for cases where the fundus has not passed the internal os. In acute cases, immediate reposition is usually advisable, but Freidman defers manipulation in cases of severe shock, provided the hæmorrhage can be controlled. Leaving an adherent placenta until after reposition has many objections; its removal is then more difficult, and it adds to the bulk to be replaced. Freidman believes that the vaginal method of reposition will be replaced by abdominal section and intra-abdominal dilatation of the cervical ring. He reports two cases successfully treated in this way when attempts at taxis had failed.

CYSTIC DEGENERATION OF AN OVARY LEFT BEHIND AT A RADICAL OPERATION.

CALMAN (*Centralbl. f. Gynäk*, Leipzig, 1905, November 25) describes the case of a woman upon whom a hysterectomy was performed for uterine myomata, right pyosalpinx, and chronic salpingitis of the left side. The left ovary, which appeared to be normal, was retained. Three years later the patient had symptoms of the menopause, and a large corpus luteum cyst of the left ovary was discovered. The cyst was removed, but the climacteric symptoms remained unchanged.

FOREIGN BODIES IN THE UTERUS.

HELLIER (*Practitioner*, London, 1906, February) reports the following case:—P., æt. 34, stated that she passed a hair-pin into the uterus, as she thought "there was something to come away." Previous to this she had been passing clots at her periods. She denied any suspicion of pregnancy. She complained of bearing down, hypogastric pain, and painful defæcation. Per vagina one point of a hair-pin was found projecting from the middle of the posterior cervical lip. The pressure of the foreign body was further detected on passing the sound. The pin, 3¼ in. long, was removed without difficulty. Hellier states that so far 127 examples of foreign bodies in the uterus have been reported, and he gives his results of a study of the literature on this subject.

OVARIOTOMY.

FRITSCH (*Festschr. f. Olshausen*, 1905) gives the results of twenty-two years' experience of this operation. Operations on the appendages are excluded. He reports 989 ovariotomies, classified as follows:—52 parovarian cysts; 49 solid (carcinomata) tumours; 18 papillomatous cysts with ascites; 1 simple papillomatous cyst; 14 sarcoma; 6 fibroma; 89 dermoids; 12 hæmatoma; 2 suppurating cysts; 192 bilateral cysts; 554 simple cysts. There were seventy deaths, caused as follows:—2, post-operative hæmorrhage, the result of slipping of the ligature of the pedicle; 8, intestinal obstruction; 11, incomplete operations because of carcinoma; 2, cirrhotic kidneys; 2, pyelo-nephritis; 12, shock in first twenty-four hours; 6, peritonitis following suppurating cysts; 27, sepsis. Mortality, 7·1 per cent.

TEN CASES OF CÆSAREAN SECTION WITH TRANSVERSE FUNDAL INCISION.

SAPELLI (*La Ressegna d'obst. e gin.*, 1905, No. 9) recommends Fritsch's fundal incision, as there is less hæmorrhage and danger of wounding the placenta. In the ten cases reported, the pelvic contraction was not extreme, so that the indication for the operation was only relative.

All mothers and children recovered. Sapelli urges section more frequently for minor degrees of pelvic contraction, as a substitute for premature labour or symphyseotomy. In two of the cases, hæmorrhage from atony of the uterus was arrested by plugging the uterus through the fundal incision.

THERAPEUTICS.

UNDER THE CHARGE OF

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ROEMER'S PNEUMOCOCCIC SERUM IN CROUPOUS PNEUMONIA.

WINKELMANN (*Munchen. med. Wchnschr.*, 1906, No. 1) records his experiences with this serum in a series of sixteen cases of very severe pneumonia. The serum is obtainable from Merck, and is polyvalent and bactericidal, but is not antitoxic in its action. The serum is prepared by inoculating horses, bullocks, and sheep with different strains of pneumococci obtained from human sources. No reliable method has been discovered for standardising the strength of the serum. In regard to its action, it should be remembered that, as the serum is not antitoxic, on using it we introduce immune bodies, the amboceptors, which unite with the complementary bodies already present in the patient's blood, and enable them to come into touch with the receptors contained in the bacterial bodies. Consequently, it follows that unless these complementary bodies already exist in the patient's blood, not much action can be expected from the serum.

In all the cases in which the serum was used, the prognosis was very doubtful from the presence of alarming symptoms. The ordinary dose of serum was 20 c.c., given in one injection, but in a few cases this dose was repeated or a further injection of 10 c.c. was given. Other writers, who have used the serum, state that its use is attended by a remarkable amelioration in the subjective condition of the patient; but Winkelmann is only able to confirm this statement to a limited extent. It occurred in six of the cases, but in the majority of those injected it was not observed. As regards the physical signs, in six cases no change occurred, but in four instances signs pointing to resolution followed more or less promptly on the use of the serum. In other three cases, however, the serum did not prevent the spread of the disease to other portions of the lung. Seven of the cases showed signs of pulmonary œdema, and of these three died. Altogether, the recovery of cases must be considered a favourable percentage. No markedly beneficial action on the circulation was observed. The pulse rate corresponded to the temperature, and no alteration in blood pressure was produced. Further, the serum did not increase the number of leucocytes in the peripheral circulation. In all the cases in which the serum was used a preliminary examination of blood was made, to see whether a condition of pneumococcæmia existed. In six of the cases the cocci were demonstrated in the blood, and in three of these cases the use of serum was followed by the disappearance of the cocci from the blood. The other three cases died. No unpleasant side action of the serum has been observed. The serum may be said to be most probably innocuous, but it is impossible to measure its healing power; still, in some of the severest cases, it was distinctly of benefit. Consequently, Winkelmann holds that the serum should be used in very severe cases of pneumonia.

The Action of Chloral Hydrate, Hedonal, Isopral, and Dormiol.

Mayor and Nutritziano publish the results obtained from an elaborate comparative study of the effects of these drugs on the circulation. The method they employed was to select a drug from the same pharmacodynamic group, whose action is already definitely known, and compare carefully the action of corresponding doses of the new and the old drugs. The findings are, as it were, expressed in terms of the known drug. In this investigation chloral hydrate was selected as the standard drug, and the other drugs were carefully tested against it. The experiments were carried out on rabbits and dogs. In the former animals, the effect of hypnotic doses was determined; in the latter, the action of anæsthetic doses was studied. As a preliminary step, the hypnotic dose for rabbits was fixed. The drugs were all administered as 1 per cent. solutions by direct injection into the marginal vein of the ear. To produce the hypnotic action, the rabbit requires for each kilo. of body weight 0·12 grm. of chlor. hyd., 0·13 grm. of dormiol, 0·07–0·08 grm. of hedonal, 0·06 grm. of isopral. The effect of such doses on the circulation is shown in the following table, in which the normal pulse and pressure rates are raised to 100 and the other figures correspondingly altered:—

	Chloral.		Dormiol.		Hedonal.		Isopral.	
	Fourteen Experiments.		Eighteen Experiments.		Twenty-one Experiments.		Ten Experiments.	
	Pressure.	Pulse.	Pressure.	Pulse.	Pressure.	Pulse.	Pressure.	Pulse.
Before injection . . .	100	100	100	100	100	100	100	100
At end of injection . .	85·8	95·2	93·2	93·6	90·3	92·2	96·5	104
Twenty minutes after injection	83·6	91·2	92·9	91·9	92·7	91·6	92·4	100

In the rabbit, the effect of chloral in hypnotic dose is more depressing than the other three drugs.

Similarly, the experiments on dogs with anæsthetising doses show that the depressant effect of chloral is the most marked. These experiments were carried out on the same dogs, that is to say, the animals received on one occasion chloral hydrate and on a subsequent occasion the other drug. Dormiol resembles chloral hydrate most nearly in action, but even it is distinctly less depressing. Thus out of sixteen dormiol-chloral comparative experiments on the same animals, the circulatory depression was more marked with chloral in ten cases, while only in three instances was the action of dormiol distinctly more depressant; in the remaining three cases the difference was trifling. Stated in other terms, in ten cases chloral hydrate caused a fall of pressure equal to 25 per cent. and upwards, whereas dormiol only did this on five occasions. For hedonal the figures are more strikingly favourable. Out of thirteen cases the action of chloral was more depressing in eleven. In nine animals the resulting fall with chloral was 30 per cent., while this occurred only twice with hedonal. Isopral in only one out of eleven experiments caused greater depression of blood pressure than chloral. While with isopral only four cases showed a fall of 25 per cent., in eight cases this occurred with chloral.

The authors state that chloral hydrate is most depressing, then comes dormiol, while isopral and hedonal are bracketed together as least injurious to the circulation. Practically they think that dormiol resembles chloral hydrate too closely in its action to be of advantage as a substitute. Of the other two drugs, hedonal and isopral, the difference in toxicity is distinct, but is not sufficient to lead to the complete displacement of chloral hydrate, which has the following points in its favour. It is readily administered. Its action is fairly certain, and is easily observed, as we know it thoroughly. But in exceptional cases where we have to deal with a diseased heart, one would hesitate to employ chloral hydrate. In such a case, if it is necessary to employ a drug of the chloral group, it would be better to use hedonal. The preference is given to hedonal on account of the fact that it is less soluble than isopral, and consequently, though slower in action, presents less chance of the heart being paralysed from the sudden absorption of the drug.—*Rev. méd. de la Suisse Rom.*, Genève, 1905, December 20.

The Action of Alcohol upon the Circulation.

H. C. Wood and D. M. Hoyt have made an elaborate investigation of the action of alcohol on the circulation. The experiments were of different types, and were directed—(1) To determine the effect of alcohol on the arterial pressure in uninjured animals. (2) A limited number of experiments were made upon dogs suffering from distemper, to determine whether the action of alcohol in the presence of fever is the same as in healthy animals. (3) The effect of alcohol upon the arterial pressure, when the vasomotor centres were thrown out of action by section of the spinal cord at different levels, was studied. (4) Among other facts to which special attention was directed was the effect of alcohol upon the rate of the blood flow. For this purpose experiments were made upon healthy dogs with Ludwig's *stromuhr*. (5) Finally, the action of alcohol upon isolated reptilian hearts was studied. As the results of their investigations, the authors claim that in the normal dog alcohol does not usually, either in small or large dose, distinctly increase the arterial pressure, although occasionally such an effect appears. The action of alcohol in dogs suffering from an infective fever, at least so far as the blood pressure is concerned, is similar to its influence upon the normal dog. As regards the influence of the vasomotor centres, they find that, after the general vascular system has been removed from the dominant influence of the vasomotor centres by section of the spinal cord in the cervical region, alcohol distinctly and consistently increases the arterial pressure. The exhibition of small quantities of alcohol distinctly increases the rate of flow of blood through the larger arteries. This increase in rate of flow is not dependent upon increase of the blood pressure, as it may occur without the pressure being sensibly affected. On the isolated reptilian heart the addition of small doses ($\frac{1}{4}$ to $\frac{1}{2}$ per cent.) of alcohol to the nutrient fluid markedly and persistently increases the amount of fluid pumped through the heart in a given time, showing a marked increase in the amount of work done by the heart. The authors believe that these experimental facts point to a stimulant action upon the heart, while at the same time there is dilatation of the vessels due to depression of the vasomotor centres. The cardiac stimulation is sufficient to neutralise the depressing influence of vascular dilatation upon the blood pressure, while, as the result of the diminished peripheral resistance and increased cardiac action, the blood flow is greatly increased and the heart is able to work at a better advantage. There is no proof that alcohol is a direct stimulant of the cerebral cells, but the consumption of alcohol at a dinner is attended by an increase in the amount and brilliancy of the conversation, and this is associated with flushing of the cheeks, so that it is quite possible that this increased mental activity is due not to a direct stimulant action of alcohol upon the cerebral cells, but indirectly to the enormously increased flow of blood running through the cerebrum.—*Mem. Nat. Acad. Sc. Wash.*, 1905, vol. x.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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The Germ of Syphilis.

Papers continue to accumulate upon observations made upon the primary and secondary lesions in relation to the presence therein of the *Spirochæte pallida*, as it was first named by Schaudinn, its discoverer. It has often been called the *Spirillum pallida*, and several observers have described its presence in lesions such as cancers obviously not of syphilitic origin. The differentiation of these germs from the true syphilitic microbe is of great importance. There exist already a considerable number of authentic spirochætes, such as the *Spirochæte refringens* and the *Spirochæte plicatilis*, and Schaudinn (*Deutsche med. Wchnschr.*, Leipzig, 1905, S. 1667) now recommends that the syphilitic spirillum should be called the *Spironæma pallida*, a name first suggested by Vuillemin (*Compt. rend. Acad. d. sc.*, Paris, 1905, vol. cli. p. 1567). No one has yet succeeded in cultivating the *Spironæma pallida*, and since our present knowledge of it is confined to its appearances in the morbid products, we have to depend solely upon its morphological characters and its staining reactions for its recognition. A certain amount of dubiety in its true recognition is thus inevitable, particularly since there are at least four or five different kinds of spirilla, without counting the *Spironœma pallida*, which may be got from human morbid products. Schaudinn lays stress upon the following characters:—(1) Its great thinness; (2) the presence of six to twelve main curves, *i.e.*, counting both the convexity and concavity of each wave as a curve; (3) the pointed extremities; and (4) its pale red colour when stained with Giemsa's stain, other and similar looking spirilla staining blue. Metchnikoff thinks that too much reliance should not be placed upon either the morphological or staining characters, for in the course of his work on syphilis he met with spirilla in the primary sore of a macaque, of typical shape, etc., except that they stained blue and not red with Giemsa. This chancre, when inoculated into a chimpanzee, produced another chancre in which spirilla similar in form and general aspect were obtained, and yet were coloured red by the same stain taken from the same bottle. He regards the following as most important points:—(1) The almost constant presence of the *Spironœma pallida* of Schaudinn in the primary and secondary lesions both in man and in the monkey; (2) the presence of this spironæma in cases of syphilis which have been investigated in countries widely separated geographically, such as Europe and America; (3) the presence, often in great numbers, of these germs in new-born infants suffering from hereditary syphilis; (4) the existence of these germs in the blood now established by several observers, particularly by Naeggerath and Stähelin. Metchnikoff gives these views in an important paper, in which he gives particulars of his experiments on monkeys, and sums up the whole subject in the *Ann. de l'Inst. Pasteur*, Paris, No. 11, 1905, November 25. He further argues that failure to cultivate the organism artificially holds true of the Trypanosoma, etc., as well as of the Spironæma, and yet we accept these germs as the undoubted cause of their accredited diseases, that even if we were to find in a case which was not syphilitic a spirillum having ten to twenty-four narrow twists, coloured red by Giemsa and possessing all the other characters of the *Spironœma pallida*, it would only show that there existed spirilla closely resembling each other microscopically just as the bacillus of tubercle and leprosy do. He thinks that we may justly now regard syphilis as a chronic spirillosis with relapses. Up to the time of writing his paper, Metchnikoff had searched for the *Spironœma pallida* in thirty-one cases of experimental syphilis in monkeys, with the following results:—He found it in eight out of ten cases in the chimpanzee. In one of the two negative cases the animal died a few days after the appearance of the chancre, and the investigator had only made two attempts to find the germ. Failure to find it did not signify so much in this case, as another chimpanzee inoculated with the same human virus at the same time also developed a chancre, from which the germ was obtained in large numbers,—as many, indeed, as are seen in hereditary syphilis of the new-born. In places they found ball-like masses, and a month afterwards they were still present in considerable numbers. They were found also in the exudate taken from a mucous patch in the mouth of the same chimpanzee, but not in the papules on its skin. Other germs, particularly cocci, often accompany the spirilla. In one of the chimpanzees inoculated, both on the upper eyelid and on the lip, a chancre appeared in both places. The former showed many of the true pale spirilla, whilst the latter did not show one. This fact and others show a great variability in the distribution of the spirilla. An examination of the exudate from the same chancre of the same monkey, taken at intervals of a few days, sometimes shows the spirilla in abundance and sometimes shows none at all. In six cynocephalic monkeys, in which the primary chancres were typical, only four showed the germs. In the other two he never found them, though there was no doubt about the chancres, for besides being typical, the first appeared after inoculation of virus from a human chancre, and the latter after inoculation of the scrapings of a secondary skin papule in a syphilitic chimpanzee. Again, in his cases in the macaque monkey he succeeded in eleven and failed in four, although the primary chancre in these cases was typical and the source from which the inoculation was made, *e.g.*, in one the primary chancre of a chimpanzee, showed the germ in large numbers. He took four films in each case, and it several times happened that only one out of the four were positive. It thus becomes obvious that in cases where all four were negative, he might if he had taken five or ten got a positive one among them. Some of his negative results might easily in this way have been changed into positive ones. Thus negative findings do not prove anything. They are common in other chronic diseases, such as lupus, without causing us to doubt in any way the true nature of the disease. To sum up, in all his experiments on the thirty-one monkeys he found the true germ in twenty-three cases, *i.e.* in 74 per cent. If we take this result as indicating that we may look for failure in finding the germ in from 20 to 25 per cent. of true cases of syphilis, we get a probable explanation of why some competent observers have failed to find it at all, and also of why it has remained undiscovered for so long. Even in hereditary syphilis of the newly born, though the germ is usually present in great numbers, there are cases in which it is scanty or even absent. In all Metchnikoff's cases he never found the *Spirochæte refringens* nor any other spirillum save only that of syphilis.

Preventive Inoculation against Syphilis.

The earlier part of the present paper of Metchnikoff is devoted to his further researches on this subject. He found that syphilis could be transmitted to various species of monkeys, *e.g.*, anthropomorphoid, cynocephalic, and macaque, and that the lower forms presented a greater resistance to the disease than the higher anthropomorphoids. He therefore set himself to find whether previous vaccination of these higher forms with the virus of syphilis, taken from the lower forms, conferred upon the former any protection against human syphilis. In only one such experiment did he get favourable results. He then tried to immunise animals with the blood of syphilitic individuals in order to obtain a serum from them of value for the treatment of the disease in other monkeys, but all his experiments showed that the serum was unable to confer any protection. He gives one out of many similar cases. A chimpanzee inoculated on both eyebrows with syphilitic virus taken from the chancres of two monkeys, was at once treated by injections of serum from five immunised monkeys. One of these, a macaque after having shown a chancre resulting from inoculation with the virus of a human chancre, had received under its skin during the space of four months 62 c.c. of blood taken from syphilitic people (with typical roseolar rashes). The other four, after the chancres had healed, had received during the space of seven months 105 c.c., 108 c.c., 88 c.c., and 73 c.c. respectively of blood taken from syphilitic people. The injected blood was absorbed in a few days. The macaque and the four other monkeys were bled several times, and the serum thus obtained was heated to 57° C. for an hour and then injected into the chimpanzee; but in spite of this injection beginning at the same time as the primary inoculation with the syphilitic virus on both eyebrows, and being continued for thirty-eight days thereafter until 55·5 c.c. in all was injected, the chimpanzee developed a typical chancre in forty-five days after the primary inoculation. This chancre showed no improvement when the serum injections were continued, but the retromaxillary glands became enlarged, and in twenty-four days more, after 76·5 c.c. of serum had been injected, syphilitic papules appeared on the skin of the abdomen. In short, the serum treatment is seen to be incapable of checking the development of either the primary or the secondary lesions. An attempt was now made to test the influence of the serum upon the syphilitic virus *in vitro.* A chimpanzee was inoculated with syphilitic virus previously mixed with blood serum taken from a monkey immunised over a period of eight months. It lived for thirty-eight days, and died from broncho-pneumonia, without showing any sign of syphilis. In nearly all his inoculation experiments the primary sore appeared in a shorter time, rarely so late as the thirty-eighth day. The result, though hopeful, was inconclusive. The same experiment was made upon another monkey, which is still alive and showed no sign of syphilis six months after inoculation; but another monkey inoculated in the same way and in the same place with syphilitic virus, previously mixed, not with blood serum from an immunised animal, but with its own blood serum, developed incontestable chancres on both upper eyelids. In another series of experiments he inoculated the virus, and then shortly afterwards rubbed the inoculated part with a powder prepared from the dried blood of immunised monkeys, thinking that a mixture of the virus and antibody would thus occur within the body. In this series a chimpanzee was inoculated on the two eyebrows with virus from a human chancre, and forty-five minutes afterwards the parts inoculated were rubbed with a fine powder obtained from 9 c.c. of desiccated immune serum. The animal died forty days after inoculation, without showing a trace of syphilis. As a control, another chimpanzee inoculated with the same virus, and treated with a powder got from the blood of a new or non-immunised monkey, developed a typical primary chancre on the twenty-eighth day. A cynocephalic monkey inoculated on both upper eyebrows with human virus, and one hour afterwards rubbed with a powder obtained from the blood serum of two immunised monkeys, showed no sign of syphilis 143 days thereafter; but a chimpanzee, which is of course a higher type of monkey and hence more susceptible, inoculated on the lip with human virus and treated one hour afterwards with the same powder, developed a typical chancre in twenty-six days. The preventive effect of serums mixed with the virus or applied shortly after the virus, shows little constancy; but on the whole there is ground for hope that, if we can obtain a serum much more potent than we have been able to procure up to the present time, better and more promising results will be obtained.

PHYSIOLOGY.

UNDER THE CHARGE OF

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THE ACTION OF LIGHT BATHS ON RESPIRATION AND CIRCULATION.

FINSEN and his pupils have mainly referred to the direct and immediate effects of light rays, and have not paid much attention to those later effects which are to be observed in connection with respiration and circulation when the patient has been subjected daily to this form of treatment. K. A. Hasselbalch (*Skand. Arch. f. Physiol.*, Leipzig, Bd. lxx. S. 431) has recently carried out upon himself a prolonged series of experiments in order to study the effects of light treatment upon the above-mentioned system. The light bath was furnished by an arc lamp of 65 volts, with a 150-ampère current. During one hour all parts of the body were exposed in turn to the rays, the eyes, of course, being protected in the usual way. The pulse rate, the mean arterial pressure (by Hill and Barnard's sphygmometer), the gaseous respiratory exchange, and the respiratory frequency, were all taken. It is scarcely necessary in this abstract to refer to the precautions which were adopted in order to eliminate any fallacies introduced from the observer and observed person being one and the same. It will be sufficient simply to give a short résumé of the principal results: (1) The cutaneous hyperæmia produced by the rays decreased markedly the frequency of the respirations, and this decrease often persisted for several days. (2) The hyperæmia frequently disappeared before the respirations became normal again. (3) The *pulmonary ventilation* is, as a rule, uninfluenced by the condition of the cutaneous vessels. That is to say, the slowing of the respiratory rhythm, which has just been referred to, is accompanied by a corresponding increase in the depth of the respirations. (4) The *respiratory exchange* is raised to a very slight extent on the first day after the light treatment. (5) The *respiratory frequency* is a function of the condition of the innervation of the peripheral vessels. In other words, the action upon the respiratory centre is probably brought about through impulses passing along afferent nerves. (6) The *mean blood pressure* in the brachial artery falls about 8 per cent. after light treatment. For a given lamp this decrease is constant, and more prolonged treatment does not affect it. It may continue for a month after treatment has ceased. (7) The *pulse frequency* in some people is practically unaffected; in others there is acceleration. (8) In the case of many individuals, each fresh light bath, if it produce erythema, at the same time has a distinct stimulating effect upon the mental condition.

The Effects of Oxygen Hunger in Mountainous Regions.

All who are interested in the subject of aero-therapeutics must feel that they owe a great deal to Zuntz and his pupils for their excellent work in this department. Most valuable results have been arrived at from the investigations carried out on Monte Rosa among other mountains, and recently Zuntz delivered an address, embodying the most important of these results, before the Berlin Physiological Society, which has just been published in their transactions (*Arch. f. Physiol.*, Leipzig, Supplement Band, 1905, S. 416). It is frequently stated that, even on the highest Alpine peaks, the diminution of the partial pressure of the oxygen is not accountable for the disorders which we associate with mountain climbing. Zuntz grants that there are other factors besides this one which affect the mountain climber, but he holds that the diminution in the oxygen pressure existing at distinctly lower levels than 5000 metres has very marked effects upon the respiratory exchange. If an individual be subjected to diminished atmospheric pressure in a pneumatic cabinet or in a balloon, the first change in the respiratory quotient is a rise due to an increased excretion of CO_2, while the O_2 intake remains almost unaffected. With further diminution of pressure the latter becomes gradually lower, until before death there is a tremendous fall in the intake of oxygen, the CO_2 excretion showing no alteration. In many persons a diminution of oxygen, which could not be tolerated in the resting condition, can, owing to alterations in the mechanical respiratory movements, be borne if moderate muscular work be performed.

The symptoms of oxygen hunger may be noticed at by no means high levels. These are evidently due to a diminution of blood circulating in the muscles, accompanied by an increased consumption of oxygen but insufficient combustion, and the appearance of intermediate bodies (acids), which raise the respiratory quotient. The increase in the formation of these bodies leads, according to Galeotti, to a diminution in the alkalinity of the blood and in its CO_2 percentage. Durig and Zuntz found that, after staying some time at high levels, this high respiratory quotient comes down to the normal again. The diminution in oxygen and the increase in carbonic acid are corrected by the stimulating action of the altered blood upon the respiratory centre. The lack of oxygen probably acts indirectly on the centre by means of the intermediate products of oxidation which are formed in such a case. It is the increase in CO_2, or the presence of these acid bodies formed from incomplete oxidation, that act as stimuli for the centre. This is well shown in cases where, after a person has become more or less accustomed to the diminution in oxygen pressure, a free supply of oxygen is given, and at once there are signs of increased stimulation of the respiratory centre. The reason for this is that gradually the centre had adapted itself to the altered conditions, and although the acid intermediate products of oxidation were present, they produced no stimulating effect upon the centre, until the excitability of the latter was raised by a fresh supply of oxygen. This diminution in the excitability of the centre often results in a periodic respiratory rhythm such as Cheyne-Stokes' breathing. Zuntz investigated carefully the influence of other factors which might play a part in the respiratory alterations occurring in mountain climbing, *e.g.*, the effects of sunlight, cold, etc. At any height above 3000 metres, whatever the external conditions might be, there was always increased pulmonary ventilation. This occurred even when at these heights absolute rest in bed was preserved. It seems most likely that the diminution in oxygen *per se* diminishes the excitability of the centre, but that this is compensated, or rather over-compensated, by the action of incomplete products of oxidation. The respiratory centre is less sensitive at the beginning of life than later, thus in the case of very young animals an increase in CO_2 has not the same exciting effect upon respiration that it has in the case of older ones. The increase in pulmonary ventilation in the resting adult is proportional to the rise in the CO_2 tension, but in muscular action it is due to the effect of the products (acid in reaction) of that activity upon the centre regulating respiration. A most interesting fact, and one difficult to explain, is the increased consumption of oxygen by persons at very high levels, not only when working, but also when at rest. The reason why a man climbing at a very high level uses up an absolutely larger amount of oxygen than at a lower level, is that his muscles being insufficiently supplied with oxygen are no longer so functionally capable, and hence additional muscles are brought into play, movements become badly co-ordinated, and thus more oxygen is consumed by the larger number of working elements. The reason why the same person, even when resting at this high level, consumes a larger quantity of oxygen than at lower levels, is that the conditions under which the heart and respiratory muscles are acting are much less favourable than in the latter case, the increase in the respiratory rate therefore entailing a larger consumption of oxygen. The difficulty of respiration is increased by the expansion of the intestinal gases interfering with diaphragmatic movements. There is also probably a stimulation of the special motor centres by the products of incomplete oxidation, and this will cause an increased consumption of oxygen by the tonically stimulated muscle groups.

DISEASES OF THE EYE.

UNDER THE CHARGE OF

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Keratitis produced by Aspergillus.

Though such affections are certainly rare, they are fairly well understood at the present date, at least in a general way; the purpose of the paper under review is to impart greater definiteness to our knowledge of the subject. The first writer on the subject of aspergillosis of the eye seems to have been Leber in 1879, and since his description was published a number of other authors have written on the subject. In all the cases there has been some accident connected with agricultural affairs preceding the onset,—a scratch with an ear of corn, with a chestnut spike, or what not. The affection begins with a small depressed ulcer, yellowish white at the centre, and forms later either a projection like a flattened phlyctenule, but looking dry, hard, and friable, or a sort of sub-epithelial abscess. The affection is always accompanied by conjunctivitis, hypopyon at a subsequent stage, iritis, and a very considerable amount of pain. The whole process is slow in progress, lasting two or three months. At the end of one month there is usually a line of demarcation round the original focus, the line being in reality a whitish ring of infiltration. This seems to prevent the further extension of the aspergillus in a lateral direction, which may then die out, or may spread in depth, and the cornea become perforated; in this way the eye may even be completely lost. Collomb has drawn attention to the fact that (as in certain other forms of infection) it is specially the central region of the cornea which is apt to be attacked,—that part, namely, where infection is most easy, and defence is, on account of the absence of vessels, least vigorous. Apparently *Aspergillus fumigatus* is found in the majority of the cases, but this may, perhaps, be due not only to the infectivity of this fungus, but also to the fact that it is the growth which produces the most typical affection; it is therefore the most certain to be recognised clinically and investigated. Experimental infection of the cornea (in the rabbit) with *A. fumigatus* has resulted in keratitis, in hypopyon, and, in a few instances, even in panophthalmitis. *A. niger* has similar pathogenic properties.

Rollet and Aurand have undertaken a new series of experiments to determine the harmfulness to the cornea of nine different varieties of aspergillus, taking special note of the age of the growth at the time of infection. With all their conclusions we are not concerned; but in view of the fact that the human cornea is decidedly vulnerable to certain varieties at all events, it is worth while to notice specially the following points as exemplified in the cornea of the rabbit:—*A. fumigatus* is very pathogenic, and the appearances produced in the cornea are precisely analogous to those which have been observed clinically in man, only that the reaction is less severe. The same is true, but to a less degree, of *A. flavus*, *A. oryzæ*, *A. niger*, *A. ficuum*, while the other forms experimented with were apparently not pathogenic at all; their names we may therefore omit.—*Rev. gén. d'opht.*, Paris, 1905, December 31.

THE DIFFICULTY CAUSED BY THE CAPSULE IN THE EXTRACTION OF CATARACT.

THE fact that the capsule of the lens must, in the ordinary method of extraction, remain in the eye, constitutes a serious menace to the completeness of the success of that operation. In the first place, a membrane which may not retain its transparency is left in the path of the light rays, and vision may thus be reduced; and, in the second place, a subsequent operation of "needling" is then called for, which may, and sometimes does, entail more physical and mental suffering than the original extraction, and which has even led to the total loss of vision. That this is a serious matter is made plain in the interesting paper of Collins, who classifies the complications which may arise from the presence of capsule under two primary heads, namely, those resulting from its adhesion to the extraction scar, and those resulting from opacity occurring in connection with it. Under the first heading, direct entanglement of capsule in the wound and adhesion of capsule to the wound by inflammatory exudation, are both carefully discussed. Where the capsule is actually included in the wound, it probably acts much like any other foreign body, causing gaping of the posterior edge of the wound, down-growth of epithelium on its anterior surface, delayed closure and consequent increased risk of septic infection, and dragging on the ciliary body. The mere adhesion of the capsule to the wound causes danger in quite a different manner, namely, by closing more or less completely in that region the angle of the anterior chamber, and so tending to set up glaucoma.

Capsule left in the eye becomes thicker, probably largely in virtue of its elastic contraction after section, and is apt to be wrinkled, these wrinkles necessarily tending to break up light and reduce accuracy of vision, and between them the cells tend to reproduce a somewhat fibrous tissue. Besides this, one has to take into account any lens matter which may be left undissolved by the aqueous, and any adventitious fibrous tissue caused by exudation from the iris or ciliary body, and by blood clot.

It is therefore evident that removal of a piece of anterior capsule (in place of a mere laceration in it) ought to give increased security from the evils of which we have spoken. Collins finds that since adopting this method he has reduced his necessary "needlings" after extraction from 47 per cent. to 4 per cent., and the present writer's experience has been very similar. He has seen no reason to regret the adoption of removal of a portion of the capsule by means of forceps in place of laceration by a cystotome, and has experienced no evil results from the manœuvre.

No one doubts that the ideally perfect operation of extraction would be one in which the lens is removed in its capsule, for, apart from the possible primary suppuration, there is no complication which more frequently and more seriously tends to nullify good results than the changes which the capsule is apt to undergo, and the inflammatory processes which are caused by irritation of it, to say nothing of the annoyance and sometimes even the total collapse of the patient's hopes following upon an operation for the removal or division of that structure. It is no wonder, therefore, that Smith (Jullundur) so strongly advocates a method of extraction in which this end is attained. The main question to be decided, then, is, Are the risks in Smith's method greater than one would be justified in running; does the end justify in this instance the means? At the outset it must be recognised that it is out of no meagre experience that Smith speaks; his record is one which few, if any, surgeons practising in Western lands can equal. His personal experience extends to over 11,000 cataract operations, and of these some 9000 have been performed by his own method. It is not so much the precise details of this method which interest one, as the system itself, but the following outline may be given, that the position of affairs may be understood. The incision made is of generous size, the angles lying well back to the corneo-sclerotic junction, the apex (if one may so call it) being about midway between the upper corneo-scleral junction and the upper limit of a moderate-sized pupil. The speculum is removed immediately the section is made; and while an assistant keeps the lids open in such a manner as to prevent any action of the sphincter of the lids, the surgeon, by judicious pressure and counter-pressure, causes the cataractous lens in its capsule to escape through the incision. Great care is taken that the capsule should not be ruptured, for if it does it will retract into the eye, carrying with it some of the soft lens matter, and the special aim of this method of operating will not be attained. This seems to occur in about 8 per cent. of the cases, but in about half of these the surgeon can at once remove the capsule with forceps. The mere escape of a little vitreous, Smith does not seem to regard as a matter of very great moment; it occurred in about 6·8 per cent. of his cases, and in the most of these there was no further evil result,—at all events, no immediate evil result.

The iritis, which is not infrequently a cause of some trouble after the ordinary extraction, Smith attributes not to bruising by the emerging lens, but to the presence of lens matter and lens capsule. "Why it follows oftener when no iridectomy is done than when it is done, is due to the fact that it is more difficult to get the last traces of lens matter out of an eye in which an iridectomy has not been done than out of one in which it has been done, and, as a consequence, it is more often left behind." The present writer, however, does not agree with the statement that iritis is more frequent without iridectomy than after it: his experience is to the contrary. Smith gives no statistics of the precise vision of his patients, obtained by the aid of lenses, after the removal of cataract. We presume that the conditions of work at his station do not admit of such being made. The writer is not aware whether any European surgeon performs the operation after Smith's method, and is not disposed to be so complacent about loss of vitreous. Most surgeons will agree that while in individual cases loss of a little vitreous is of no great moment, when cases are considered in groups the complication is one distinctly to be avoided.—*Rep. Roy. London Ophth. Hosp.*, vol. xvi. p. iii; *Arch. Ophth. and Otol.*, N. Y., vol. xxxiv. p. 6.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Medico-Chirurgical Society.—*February* 7, 1906.—Dr. Affleck, President, in the chair.—Mr. Cotterill showed—(1) A fibrosarcoma of the eighth nerve removed from the cerebello-pontine angle; (2) enlarged prostates removed by suprapubic prostatectomy.—Dr. Norman Walker showed a case of extra-genital chancre and a case of melanoma.—Dr. F. D. Boyd read a paper "On Rectal Feeding." The present knowledge of the value of rectal feeding is conflicting and indefinite, and this research was undertaken with the view of ascertaining the amount of proteids, sugars, and fats absorbed from nutrient enemata. It was found that the amount of proteid absorption is very small, and bears no proportion to the amount injected into the rectum. The albumin of eggs is therefore a most wasteful food. The amount of fats absorbed is considerable, and bears a definite relation to the amount given. The fat used in the experiments was yolk of egg. With regard to sugars, the substance used was pure dextrose, as ordinary sugars cause irritation. The influence of bacteria on the sugar injected was first tested by incubating dextrose with 5 per cent. peptone and *Bacillus coli communis.* The amount lost was less than 1 per cent. The amount absorbed is very large. The best nutrient enema is one composed of the yolk of two eggs, 30 grms. of dextrose, and 10 oz. of saline water. This should be repeated every six hours. It only gives a quarter of the nourishment required to keep up the nutritive balance, but this is the best result obtainable by rectal feeding. Nutrient enemas always give rise to some gastric accretion, therefore they should be given at long intervals so as to secure as much rest for the stomach as possible. In acute gastric ulcer it is best to give nothing but saline solution per rectum, and patients, as a rule, do very well on this for a week. Thirst is greatly relieved by the fluid. In other cases the nutrient enema should be used, but Dr. Boyd concludes from his experiments that too much must not be expected from this method of feeding.—Mr. C. W. Cathcart read a paper on Bier's method of treating acute inflammation by passive congestion. This method has been used by Bier since 1893. The method consists in applying an elastic bandage to the limb above the affected part. A fiery red appearance is produced, and the relief of pain is immediate. The bandage is kept on for several hours. Bier has used this method with great success in cases of whitlow, osteomyelitis, joint suppuration, etc. It is especially useful in cases of gonorrhœal affections of joints, and Mr. Cathcart's experience confirms this. If there is much general blood poisoning, it should not be used. The bandage should not cause any discomfort, and should not cause any coldness of the limb. There is difficulty in explaining how the method acts. It may be that there is a direct action of the serum on the poison, or a neutralisation of the ptomaines and dilution of them by the œdema. Mr. Cathcart gave an account of various cases he had treated in his wards by this method.

EDINBURGH OBSTETRICAL SOCIETY.—*February* 14, 1906.—Dr. J. W. BALLANTYNE, President, in the chair.—Dr. BREWIS, who was President of the Society, 1903–1905, delivered his valedictory address, he having been unable, through indisposition, to do so at the beginning of the session. He referred to the losses the Society had sustained through death during his term of office, and described the life-work of those who had taken a prominent part in the meetings of the Society. Thereafter he reviewed the work that had been accomplished during the past two years, and gave short summaries and criticisms of the more important papers read.—Mr. E. SCOTT CARMICHAEL read a paper entitled "A Plea for Operative Interference in Cerebral Hæmorrhage in the Child resulting from Dystochia." He made reference to the late results in untreated cases, and pointed out how unsatisfactory the treatment of such cases was. Mr. Carmichael described the conditions of mother and child which gave rise to such hæmorrhages, and remarked that it was only in a minority of cases that the application of midwifery forceps could be held responsible. In conclusion, he described the pathological and anatomical changes which were found in the cerebrum, and urged the importance of early operation in these cases.—Dr. FORDYCE read a paper on "Pregnancy in a Bicornuate Uterus, with report of a case." Dr. Fordyce, on first seeing the patient, had found a uterine fibrous polypus, and what he supposed was a fibroid, lying to one side of the uterus. The day before that fixed for removing the polypus the patient gave birth to a three-month abortion. Later, Dr. Fordyce proceeded to remove the polypus, and on passing his finger into the uterus he found a communication with another cavity in which he felt a placental site. The case was one of bicornuate uterus: a polypus occupied one horn, an ovum the other.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.—*February* 2, 1906.—The President, Dr. LINDSAY STEVEN, related the clinical history and showed a specimen from a case of round-cell sarcoma of the frontal lobes, associated with mental symptoms.—Dr. ROBERT BISHOP read a short paper on "Diet in Gout, Rheumatism, and Arthritis."—Drs. J. W. FINDLAY and R. M. BUCHANAN reported a case of typhoidal cholecystitis—operated on by Dr. Henry Rutherfurd—in which the usual symptoms of typhoid were absent, and in which the bacillus typhosus was isolated from the cystic and intestinal contents. Dr. Buchanan showed cultures and film-preparations of the typhoid bacillus isolated from this case.

February 16, 1906.—Dr. J. CRAWFORD RENTON read notes of the following surgical conditions:—(*a*) Ruptured gastric ulcer, with three illustrative cases; (*b*) dilatation of the stomach caused by adhesions round the pylorus, with account of two cases in which the operation was performed; (*c*) malignant disease of the rectum with reference to treatment by Kraske's operation (three cases); (*d*) renal abscess, with and without calculi, with report of cases; (*e*) removal of Gasserian ganglion. Dr. Renton also showed the following:—(*a*) An adult patient upon whom laminectomy was performed three years ago for Potts' disease; (*b*) a patient from whose larynx an epithelioma was removed two years ago; (*c*) two patients upon whom Ballance's operation was carried out for chronic ear discharge; (*d*) a patient who had an ununited fracture of the tibia, in whom 1½ in. of the fibula were excised in order to obtain a satisfactory result; (*e*) a ruptured kidney removed from a patient, æt. 17 years, who was injured at football; (*f*) 600 gallstones removed from one patient.—Dr. CHARLES C. CUTHBERT read a short note on "Ludwig's Angina," and gave a short account of a case.

FORFARSHIRE MEDICAL ASSOCIATION.—*February* 1, 1906.—Dr. SINCLAIR in the chair.

Mr. GREIG exhibited two patients after operation for the radical cure of varicocele and hydrocele.—Professor STALKER showed a specimen of perforating ulcer of the stomach, with, alongside it, a cicatrix of a former ulcer. Also a specimen of cancer of the liver with a nodule at the biliary papilla.—Dr. PIRIE showed radiograms of the thorax in health and disease, including several cases of tubercle of the lung in various stages, carcinoma of the mediastinum with displacement of the heart, and hypertrophy of the heart.—Professer KYNOCH read notes on three cases of labour complicated with carcinoma of the uterus. Two of the cases were not seen until some weeks after confinement, when examination discovered advanced cancer of the cervix, and vaginal hysterectomy was performed. The third case was seen in labour, which was a breech presentation, and hysterectomy was performed ten days later. He discussed the treatment if the condition were discovered during pregnancy. If detected before the sixth month, he advised immediate removal of the uterus without regard to the fœtus. If discovered later and the disease was extensive, it was best left alone. The results in any case were unsatisfactory.—Dr. DON read a paper on the "Diagnostic Value of Radiography in Fractures." The object of the paper was to bring out the value of radiographing all obscure and difficult bony lesions, both before and after putting them up in splints. By such means only could the best possible results be obtained, and the surgeon would be saved the ignominy of having failed to diagnose and properly treat a fracture, and possibly having to defend his work if an action of damages were brought against him. The surgeon should therefore be able to correctly read a radiogram when the details of the taking of it were given him. How necessary it was to know the details was illustrated by a series of radiograms showing distorted views of accurately set fractures, and radiograms of fractures in which the lesion was completely obscured. The blurring effect of secondary and adventitious rays was shown and explained, as well as the production of these rays. It was also shown how dense muscular tissue or blood clot, and the overlapping of bones in joint lesions, were apt to hide fractures unless the best position for taking the radiogram had been first ascertained by examination with the fluorescent screen. The medico-legal aspects of radiography were also considered.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

Wendell Holmes on Puerperal Fever.

To most of us in this country, the name of Ignatz Semmelweis, a young intern in the Vienna Hospital in 1847, is associated with the first distinct advance in our knowledge of the cause of puerperal infection, and he was amongst the first to demonstrate the effects of prophylactic treatment. Semmelweis had observed the fact that in the wards attended by midwives the mortality was much less than in those attended by students. He showed conclusively that when the students were required to disinfect their hands with chloride of lime the proportion of septic cases was very materially diminished. Semmelweis got no thanks, but only ridicule, for his work, and it was long after his death before his views were accepted and perfected by others along the lines laid down by Pasteur and Lister.

Dr. Cullingworth, in a charming brochure, has snatched from comparative oblivion an essay by Dr. Oliver Wendell Holmes on "Puerperal Fever," which appeared in 1843. The majority of our profession recognise Holmes, and are proud of him, more as a brilliant writer and poet than as the fearless and outspoken defender of the life and health of parturient women. He had, in fact, anticipated Semmelweis in his discovery, and in this essay it is interesting to observe, as Dr. Cullingworth very clearly points out, that Wendell Holmes and the distinguished Hungarian, a few years later, arrived at the same conclusion, as the result of independent observation, and both encountered relentless opposition. Pasteur and Lister had not as yet instituted those researches which have been an effectual means not only in checking the ravages of puerperal fever, in hospitals at least, but in many cases of stamping it out.

In a very characteristic passage Cullingworth says, when the question was once put to Oliver Wendell Holmes in an American journal by an enthusiastic admirer, namely, William Osler, whether he derived greater satisfaction from being the author of that exquisite little poem, "The Chambered Nautilus," or from having published the essay on "Puerperal Fever," he replied, "I have rarely been more pleased than by your allusion to an old paper of mine. There was a time, certainly, in which I would have said that the best page of my record was that in which I had fought my battle for the poor poisoned women." What was his real feeling about the essay is shown in a passage in the "Professor at the Breakfast Table," in which he says, "By the permission of Providence I held up to the public the damnable facts connected with the conveyance of poison from one young mother's chamber to another, for doing which humble office I desire to be thankful I lived, though nothing else good should come in my life."

It is a very striking fact that, notwithstanding all the improvements that have taken place by the adoption of antiseptics in midwifery in hospitals since the time that puerperal fever was accurately defined by Holmes and Semmelweis, it still prevails to a startling extent in private practice. Though in maternity hospitals, both at home and abroad, it has decreased almost to a vanishing point, we are forced to the conclusion that an undiminished mortality takes place outside these institutions, for we have to face the unpleasant fact that the lives of more than two thousand women are annually lost in England and Wales alone, from a cause which is almost, if not entirely, preventible, and that puerperal fever continues to prevail as though Pasteur and Lister had never lived.

Is "Black" a Sensation?

The simplest answer to the question seems to be—no, because light is not reflected from a truly black body, and if the field of vision were wholly occupied by black there would be no light entering the eye and therefore no sensation. But the question is a deeper one than at first appears, and has exercised the minds of physiologists and psychologists for many years,—in fact it seems as unsettled as ever it was; many experts answer in the affirmative, and quite recently a writer, Dr. James Ward, in the *British Journal of Psychology*, after an exhaustive review of the subject, is decidedly in favour of a negative position.

The sensation of light is produced by the stimulation of the retina by the ether waves of different wave-lengths which give rise to the visible spectrum. According to the Young-Helmholtz theory of colour-vision, the presence of three photo-chemical substances in the retina is presupposed; these are acted on by the ether waves, but in varying degree by different wave-lengths, decomposition of one substance gives rise to the sensation of a primary colour, decomposition of two or more to intermediate colours, while an equal excitation of all three substances produces the sensation of white. On this theory the white and black series of sensations have no separate physiological basis. Black is merely the absence of any decomposition of the hypothetical substances, nothing is excited in the retina, and consequently there is no sensation. But Helmholtz speaks of black as a sensation in that it is the "perception of a definite state of our organ even though it is brought about by total absence of light." In a way this is quite true: one speaks of a "silence that can be felt," and by a like argument silence might be called a positive sensation, but it implies a contrast with a previous noise; it is this perception of silence which wakes the voyager on an ocean liner when the screw suddenly stops. In another passage Helmholtz says: "The sensation of darkness is the sensation of the resting state—or, if it be preferred—is the absence of sensation in parts of our nervous apparatus for vision which would be excited if a stimulus were applied to them." Helmholtz' position seems to be—that black is not a positive sensation, but a perception of the absence of a sensation. One is led to ask—what is a sensation? A black object on a white ground gives rise to what most people would regard as a definite sensation, but is it not so by way of comparison? Is the black to be considered a positive sensation, or is it perceived because its position on the retinal field gives rise to no sensation, while the rest of the field does? From a physiological standpoint, a sensation results from stimulation of some form or other of sensory nerve ending, and on the Young-Helmholtz theory of colour-vision black cannot be regarded as a true sensation.

Hering, on the other hand, affirms that black is a positive sensation, and advances a different explanation of colour-vision. According to Hering, the sensation of the deepest black is only possible when light is present. When light is totally excluded from the eye, there is still a sensation of a certain amount of light—the so-called intrinsic light of the retina—which is a mean grey. A deeper black can be appreciated when some light falls on the retina. In Hering's theory there are three pairs of antagonistic colours, black and white, red and green, and blue and yellow, which have a physiological basis in the building up and breaking down of three special substances. In the case of the black-white substance anabolism gives rise to the sensation of black, katabolism to white, and equilibrium of its metabolism to a neutral grey. Hering's theory gives a better physiological explanation of contrast than does Helmholtz' theory, but leaves the actual site and nature of the substances unsettled. There are objections to Hering's theory: why should equilibrium of metabolism of the black-white substance give rise to a sensation of grey when like equilibrium of the other two substances produces no sensation? Hering answers that all light is katabolic as regards white, but an equally good explanation would be the recognition of the negative character of black. The balance of metabolism in the black-white substance should, if it gives any sensation at all, give one that is constant, but it does nothing of the kind. The eye adapts itself to the amount of light present; a dark cavern entered from the sunlight appears very dark at first, but a stationary position is soon reached where the pitch darkness has disappeared, and the grey of the intrinsic light of the retina is perceived. On returning to the sunlight, the light is at first dazzling, but the eye again adapts itself, and another balance of metabolism is struck. The two sensations produced by the balance of anabolism and katabolism under these two conditions should be the same, but they are not. Again, if black and white are both true sensations, on Hering's hypothesis they should be equally intense, and in antagonism to a blinding white there should be a blinding black. Such a condition is difficult to imagine, and would be very awkward—fancy light and darkness equally painful!

Hering's hypothesis cannot be considered wholly satisfactory, and there is no clear evidence that anabolic processes ever lead to sensation; it is also difficult to imagine a constructive process taking place with the rapidity of a katabolic or destructive one. Nevertheless, Hering's views have found a great deal of support. Wundt and G. E. Müller especially adopt his theory, with certain modifications. There are differences of opinion about the intrinsic light of the retina, a very faint twinkling in many colours, "light dust" or "light chaos" seems nearer the mark than a medium grey.

In the present state of our knowledge it seems safer to regard the old view as the more likely, and we may conclude that black is not a sensation, or, in the words of Johannes Müller in 1846, "darkness or black is nothing but the result of the state of rest of the whole or part of the retina."

The Critic and the Criminologist.

THERE are two legitimate ways of attacking a fallacy, the one is by reason, and the other by ridicule; and it may be urged that with our instinctive love of the comic spirit the latter is often the more deadly method. In such matters as social hypocrisies it is certainly the one to be recommended, for a man may persist in his fallacy as long as he is argued with, but he hates to be laughed at. Argue with him and he may become stiffened in his purpose, laugh at him and he will gather up his rags and depart in peace. Dr. Devon, medical officer of the Glasgow Prison, has come to the conclusion that the apostles of the science of criminology may perhaps be susceptible to the latter system of therapeutics, and has been indulging in much facetious laughter at their expense. But Dr. Devon need not worry himself. We have long ago admitted that the science of criminology, as preached by Lombroso, Ferri, and their compeers, contains much that is irrational and irrelevant, but we are too wise to admit that because such is the case, the whole basis of the science is at fault. Even though we admit the inexpediency of measuring the skull and the thumb of every casual delinquent, we can still believe in the criminal type. Dr. Devon does not distinguish between the casual and the habitual criminal—the criminal by accident and the criminal by class. The former is a person capable of reform under environment, the latter only can be held in check by stern and habitual restraint. In discussing the former, he is wise in recognising the need for removing the potential criminal from an atmosphere of crime, and in this matter, no doubt, much can and ought to be done. A recent trial in the Justiciary Court proved that there still persist in our large towns virulent centres of crime. In the trial in question it was estimated that as many as seventy cases of crime had been traced to one colony alone within a few months, and that a large proportion of these cases were the result of the imitative capacity of the potential criminal, and not only to the fact that the colony had been formed by the natural aggregious instincts of the criminal. It is the duty of the authorities to root out these colonies, as a keeper would root out a vermin's nest. But the great point to be remembered by all sociologists is that crime is not in itself an offence against nature, but against society, and that in each individual lies the possibility of asserting egoistic tendencies to the detriment of the mass. Social laws are altruistic as opposed to natural laws, which are in the main egoistic, and it is only in so far as the question of social responsibility is impressed upon the individual that crime can be held in check. In the normally constituted person it is not difficult to restrain the tendency to a return to nature with its concomitant tendency to crime. But where will is weak, environment bad, and social tyranny of any nature prevalent, the power of restraint is weak. The criminologist is quick to recognise that there are classes who are markedly insusceptible to social influence, and on examination of these he discovers that they possess certain physical characters in common. That is the basis of the new science of criminology, which is not put forward as a defence of crime, but as a possible basis for reform. As regards murder, which is discussed with some flippancy by Dr. Devon, it must not be forgotten that as far as our law stands at present it takes little note of the difference between a crime of passion committed by an evidently sane person and one which is the outcome of a temperament markedly anti-social and criminal. Law, the science of fine distinctions, cannot afford at present to draw the fine distinctions of science. This may sound a paradox, but it is true nevertheless. The whole question of temperament and tendency and heredity is so mixed up with that of motive, that it is impossible to draw a clear and fast line of distinction.

And if the question were put up to discussion, one side might argue as brilliantly and as convincedly on behalf of the crime committed by the criminal of the criminologist, as on behalf of the occasional criminal who possesses none of the qualifications of the former. Who is the greater sinner? The man who sins because he is made that way, or the one who ought to and can know better? Dr. Devon is inclined to believe that there is a marked distaste amongst jurymen in Scotland towards the hanging of murderers. But we are inclined to believe that half of this point of view springs from the fact that the jury ask themselves these questions: Was it the intention of the prisoner to commit this crime in cold blood? Was it the result of his premeditated judgment, or of an insane impulse of passion? And the questions are not irrelevant. A man who does to death a fellow-citizen after due deliberation and as the expression of a point of view, cannot be placed in the same category as the one who murders out of mere passion, and in contradiction to his point of view when unhinged by momentary anger. We are not pleading that the law should always act implicitly on this distinction, for the law and public opinion are so constituted as to place dangers in the way of such a method of legislation. But in a recognition of that fact lies the future of much legal reform.

Natality and Fecundity.

EVERY now and then our imaginations are fired by reading accounts of the discovery of buried and long-forgotten treasure. It may have been the contents of some richly laden galleon, harried on to a lee shore while on its return from the Spanish Main. The spot where it met its fate has doubtless been pointed out to generations of wondering eyes, and many are the romantic stories in all probability which cluster round it,—tales of daring and arduous attempts to reach the coveted gold, sometimes partially successful, or again ending in discomfiting failure and followed by long periods of seeming oblivion of the fortune awaiting the man of indomitable energy.

Gold is not the only treasure which may thus attract the bold adventurer in the search for fame and reward, for to many there is something more prized than wealth,—the fortune of a high scientific reputation.

Buried in the Register House at Edinburgh for the last fifty years, there has existed incalculable wealth of material for the science of demography. It was known to exist by scientific workers in many parts of the world, and more than one attempt has been made to recover it. Its story is as follows: In 1855 Scotland instituted a system of birth registration, unique at any rate in this country if not in others, inasmuch as it obtained information on a number of facts in regard to the child and its parents, which was of immense importance for the statistical study of questions affecting fertility, fecundity, masculinity, and many other problems surrounding the subject. Unfortunately the birth registers were altered in the following year, so that it was only those of 1855 that contained the precious elements out of which the key could be obtained to throw light on some of the many mysteries connected with child-birth. More than one inroad was made upon these stored hoards by the Registrar-General, and more especially by Matthews Duncan in 1870, but they never succeeded in extracting more than a very small portion of the valuable material contained in them. To do this thoroughly was a work requiring immense patience, untiring energy, and, above all, an ability and capacity for dealing with intricate statistical problems which is possessed by very few.

It is greatly to the credit of Scotland, and more especially of Edinburgh, that this great work has been accomplished in the most brilliant manner by Dr. C. J. Lewis and Mr. Norman Lewis. Their combined publication, "Natality and Fecundity, a Contribution to National Demography," was referred to in our last issue by one who is himself a master in the science, but the book contains so much of interest to the generality of medical men that we do not hesitate to make some further allusions to it.

With reference to the child-bearing wives of 1855, it was found that their ages varied from 15 to 58 years, and that 28 per cent. of the wife-mothers were embraced in the quinquennium 25–29, and over 24 per cent. in that of 30–34, or, in other words, the decade 25–34 furnishes over 52 per cent. of the whole child-bearing wives. The husbands whose children were registered in the year in question numbered 84,971, and they varied in age from 17 to 86 years. The year of age showing the largest number of husband-fathers was 30, which is the same age as in the case of wife-mothers; but whereas the age of child-bearing is limited as regards the women, that of procreation by the male seems to be practically unlimited, if the statistics are a true representation of facts.

By no means the least interesting chapter is that which deals with the chronology of births, and in this, the period of time between marriage and first birth is fully discussed. Contrary to what we, and probably the majority of medical men would have stated, it has been found—if cases in which less than nine months elapsed between marriage and the first birth are for obvious reasons excluded—that the nuptial age which is likely to see a bride converted most speedily into a mother is 25 to 29, and that the average interval between marriage and the birth of a child is 17·2 months. Brides of 20 to 24 come next with an average interval of 17·86 months, whilst brides of 15 to 19 show a very distinctly longer interval. When a woman, taking all ages together, has been married five years without giving birth to a child, the probability that she will not conceive is about 17 to 1.

A subject very ably dealt with, and which will command a large amount of interest, is masculinity. We have no wish, however, to excite the hopes of would-be parents of sons and heirs. The book professes to give no magic talisman which will solve this mystery. It brings forward, however, many facts which may assist in the elucidation of the subject, and we will merely give one conclusion arrived at, which, if it does not fulfil the hopes of anxious parents, at least a trial of its efficacy will do them no harm,—"masculinity is always high in populations which live an open-air life."

In anticipation of the expiry of the lease of Saughton Hall in May 1907 and its acquisition by the Corporation of Edinburgh, Sir John Batty Tuke has taken over the Asylum at Mavisbank, and is there making extensive alterations and additions, which, it is expected, will be completed in the course of the ensuing year. Dr. John Batty Tuke has already taken up the duties of Medical Superintendent at Mavisbank, while Dr. R. C. Mornington has been appointed Resident Medical Superintendent at Saughton Hall. The arrangements existing at Balgreen will be continued as heretofore. Dr. George Wilson, formerly superintendent at Mavisbank, has taken up residence in Edinburgh.

Professor Max Nitze, the father of the electric light cystoscope, died of an apoplectic seizure in Berlin on the 22nd February. It is to his genius that the profession is indebted for the instrument which has revolutionised our knowledge of the surgical affections of the urinary organs, a debt which was recognised less than two years ago by the presentation to him of an international testimonial.

We have to record the death from pneumonia on the 9th March of T. Duddingston Wilson, M.B. and F.R.C.S., Edinburgh.

The retirement of Dr. Berry Hart, and the appointment of Dr. Barbour as gynæcologist to the Royal Infirmary, has caused a vacancy in the junior staff. Messrs. Haig Ferguson, William Fordyce, Lamond Lackie, Malcolm Campbell, and Scott Carmichael are applicants for the post.

We are glad to hear that it has been decided to recommence the Edinburgh Medical Post-graduate courses, which have latterly fallen into abeyance, and a strong committee, comprising members of the Faculty of Medicine of the University, lecturers of the School of the Royal Colleges, and other teachers, has been formed to carry out the arrangements. The next course will be held in September of this year.

ORIGINAL COMMUNICATIONS.

OBSERVATIONS ON THE CIRCUMSCRIBED ABSCESS OF BONE (BRODIE'S ABSCESS).

By ALEXIS THOMSON, *Assistant Surgeon, Royal Infirmary, and Surgeon to the Deaconess Hospital, Edinburgh.*

(PLATES VIII.–XI.)

THE pathology of Brodie's abscess of bone has excited an amount of interest which may be regarded as out of proportion to the importance of the disease. Many surgeons who have met with the lesion in the course of their operative work have published their opinions regarding it. Among the more important contributors to the literature of the subject are Cruveilhier, Broca, Trélat, and Golay in France; Volkmann, Schede, Garré, Müller, Kocher, Klose, and Gross in German-speaking countries; and Benjamin Brodie, Stanley, James Paget, Lee, Hamilton, Savory, and Battle in this country.

In view of the definite anatomical features of Brodie's abscess, it is remarkable how widely the descriptions by different authors differ in matters of detail. This is due partly to the fact that the lesion has been observed chiefly by surgeons while engaged in operating for its relief, and their facilities for investigation have necessarily been limited by therapeutic requirements. Specimens obtained by amputation of the affected limb usually illustrate an advanced stage of the lesion, from which it is not easy to deduce the manner of its development. I have myself operated on six occasions for Brodie's abscess, and in two of these have obtained the specimen entire. Professor Chiene has kindly given me a third. From these specimens I am able to illustrate the anatomy of the lesion in three stages—(1) The quiescent focus; (2) the ripe abscess; and (3) the abscess after it has ruptured and discharged externally.

CASE 1.—The first, and most interesting of these specimens, consists of the middle two-thirds of a tibia which presents two distinct cavities in its interior, one an example of the ordinary mature abscess, the other illustrating the quiescent phase of the lesion, regarding the pathology of which there is great diversity of opinion.

The specimen was obtained from a boy, æt. 15, who eight years before had passed through an attack of acute osteo-myelitis. Suppuration occurred in relation to the left femur, sinuses formed, and continued to discharge for several months; the right tibia also was affected, but did not suppurate. After an interval of seven years, the same tibia became painful and tender, and he was unable to get about without the aid of crutches; eight months before he came under my care an abscess burst over the shin, and has continued to discharge ever since.

On admission to hospital the right tibia was found to be thickened, longer than its fellow by 3·5 cm., and curved with the convexity forwards. At the junction of the middle and lower thirds, the skin of the anterior aspect presented three ulcers having undermined margins, and yielding a scanty purulent discharge; the ulcers were superficial, and no communication with the subjacent bone could be discovered. Since the abscess had burst the pain had disappeared, but the bone was still very sensitive to pressure, and especially so to percussion. An X-ray photograph showed widespread sclerosis of the shaft, with obliteration of the medullary canal, but near the centre of the bone there were two ill-defined areas where the shadow was less dark than elsewhere.

The diagnosis of relapsed staphylococcal osteo-myelitis with probable central abscess of the bone was made. The following operation was performed. The limb having been rendered bloodless, the soft parts, including the thickened periosteum, were reflected as two rectangular flaps from the anterior aspect of the bone. The bone was then divided above and below by means of a wire saw, and the middle two-fourths of the shaft removed in one piece. The periosteum was reunited with catgut stitches, and the skin sutured throughout. Healing ensued without incident, and the bone re-formed rapidly. The new shaft was broader and flatter than the normal, but within three months of the operation was sufficiently strong to allow of the patient walking about.

After fixation in formalin, the specimen was sawn in sagittal section, and presented the features shown in Plate VIII., Fig. 1.

There is diffuse sclerosis with obliteration of the medullary canal, and in the interior of the bone are two cavities which differ remarkably from one another. The larger cavity is filled with greenish-yellow pus, and is obviously a mature Brodie's abscess, and was doubtless responsible for the symptoms presented by the patient. The smaller cavity is occupied by an opaque jelly—apparently serum coagulated by the formalin—surrounded by a well-defined membrane. I regard the smaller cavity as representing the immature and quiescent phase of a Brodie's abscess.

The smaller of the two cavities measures 2 cms. in diameter, and is lined by a layer of organised tissue closely adherent to the bone, and varying from 2 to 5 mm. in thickness. On testing the resistance of the surrounding bone with a steel pin, it is found that a narrow zone around the cavity is easily penetrated, while further away this is impossible, owing to the density of the sclerosis. The jelly-like contents of the cavity are devoid of tissue elements, and no cocci can be discovered by any of the recognised staining methods.

A portion of the wall of the cavity, consisting of lining membrane and subjacent bone, was prepared for microscopical examination,[1] and presented the appearances shown in Plate IX., Fig. 2. Almost the entire thickness of the lining membrane is composed of wavy lamellæ of white fibres with a few interposed connective tissue corpuscles, and very few capillary vessels. Near the free surface there are scattered clusters of leucocytes, mostly of the mono-nucleated variety, some of them acting as phagocytes, and being packed with altered blood pigment. Near the bone, the membrane has acquired features indistinguishable from the periosteum of young bone. It is cellular and vascular, its cells present the branching type characteristic of osteoblasts, and are actively engaged in forming bone; many of the cells are becoming included so as to constitute bone cells. The new bone differs in no essential from the normal periosteal bone of a young subject. There is no trace of trabeculæ which might have belonged to the original framework.

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[1] For the preparations and micro-photographs I am indebted to Mr. Richard Muir of the Pathological Department, Edinburgh University.

The larger cavity or abscess measures 4·5 by 2·5 cms., and presents a number of pockets or diverticula, one of which approaches so closely to the cortex of the bone anteriorly that the thin shell intervening between the abscess and the periosteum can easily be perforated by a steel pin; elsewhere the pin does not penetrate the wall of the abscess more than a millimetre or two.

The contents—greenish-yellow pus coagulated by the formalin—show in prepared films various inflammatory tissue elements and clumps of staphylococci.

A portion of the wall of this cavity also, consisting of lining membrane and bone, was prepared for microscopical examination, and presents the appearances shown in Plate IX., Fig. 3. The lining membrane is composed of vascular granulation tissue, the closely packed cells of which, together with capillary vessels, are exposed on the free surface, and are in process of being converted into pus. Most of the cells near the free surface present the large vacuolated type of mono-nucleated leucocyte, and amongst them scattered colonies of staphylococci can be identified. The deeper layer of granulation tissue in contact with the bone shows two sets of changes, the one representing a feeble effort to form new bone, the other an active absorption of the old bone. The new bone is represented by a few attenuated trabeculæ devoid of lime salts. The old bone, which is easily differentiated by the bulk, shape, and faint staining of its trabeculæ, is being actively eroded by the granulation tissue; giant cells are also engaged in eroding the bone, but on a small scale compared to that of the small cells and capillary blood vessels. The marrow spaces in the bone immediately surrounding the abscess are abnormally rich in blood vessels.

Case 2.—The second entire specimen illustrates a mature Brodie's abscess in the centre of the head of the tibia, and was given me by Professor Chiene. The patient was a woman, æt. 27, who, so far as she could remember, had not suffered from any illness affecting her bones. For four months she had complained of toothachy pain referred to the left knee, and on her admission to the Infirmary this joint was found to be flexed and acutely sensitive; a few days later a large abscess burst in the popliteal space. The limb was amputated through the condyles.

On examination, the synovial membrane of the knee shows signs of recent pyogenic infection, and there is a circular aperture through the articular cartilage of the head of the tibia towards the centre of the joint. A horizontal section of the head of the bone was made, and a circumscribed abscess (Plate X., Fig. 4), measuring 2 by 2·5 cms. in diameter, was found, filled with greenish-yellow pus, and lined with a thin layer of granulation tissue. From the abscess there extends upwards through the articular cartilage a canal which opens into the knee-joint. There is no appreciable sclerosis around the abscess, the bone being cancellous throughout. The granulation tissue lining the abscess cavity (Plate X., Fig. 5) closely resembles that in the preceding specimen; there is, however, a greater proportion of large vacuolated cells on and near the free surface, and the capillaries are crowded with polyomorpho-nuclear leucocytes; the subjacent bone is being eroded by the elements of the granulation tissue, and to a less extent by giant cells.

Case 3.—My third specimen illustrates an abscess in the centre of the lower end of the femur, the abscess having perforated and discharged externally. It was obtained from a woman, æt. 55, who was sent to me by Dr. William Fordyce. Thirty-eight years before, she had suffered from osteo-myelitis of the lower end of the femur, with disorganisation of the knee-joint. The symptoms subsided under conservative measures, and although the knee became the seat of fibrous ankylosis, she was able to resume her household duties. Three years later an abscess formed above the knee and burst, and small portions of dead bone were extruded from time to time in the discharge. After a period of immunity, lasting over thirty years, fresh abscesses and sinuses formed, and when she came under my care her general condition was such that it was considered advisable to amputate the limb.

In the central axis of the lower end of the femur there is an abscess measuring 8 cms. long by 2 cms. broad, and 3 cms. distant from the articular surface. The cavity contained only a small quantity of yellow pus and three small, irregularly shaped sequestra, two of which are attached to the bone forming the wall of the abscess; it is lined by a thin, smooth, tough membrane closely adherent to the bone. The cavity of the knee-joint is obliterated by fibrous tissue, and there is bony ankylosis between the femur and the patella. The structure of the bone varies greatly in different parts of the femur; around the abscess it is only a little denser than normal; towards the cortex, especially on the popliteal aspect, it is as dense as ivory; towards the articular surface it is opened out, and presents large spaces filled with yellow marrow (a condition often observed in the vicinity of an ankylosed joint); finally, towards the shaft the bone is markedly sclerosed, and the medullary canal obliterated as high as the junction of the middle and lower thirds.

A segment of the wall of the abscess was decalcified and prepared for microscopical examination. The lining membrane is composed of closely applied lamellæ of white fibrous tissue; there are a few leucocytes scattered here and there between the lamellæ, and very few blood vessels. On the free surface the leucocytes are much more abundant, to such an extent as to break up the lamellæ into short fragments; they have taken on the hæmatin stain very imperfectly, and are apparently in process of transformation into pus corpuscles. In the deepest layer, where the membrane merges into the marrow, there are numerous large, well-formed blood vessels, and around these are collections of leucocytes, mostly of the large vacuolated type. There is no sign of any formation of new bone, and the old bone shows no evidence either of being eroded or of being added to.

In discussing the appearances presented in these preparations, we are brought face to face with the different problems which have been raised regarding the pathology of Brodie's abscess.

The quiescent stage is illustrated in the first of the specimens described (Plates VIII. and IX., Figs. 1 and 2). The lesion is represented by a minute cavity in the bone, filled with serum, and lined by a well-defined membrane resembling the periosteum of young bones. The fibrous layer of the membrane bounds the central cavity, while outside it the cellular layer is actively engaged in forming bone. The new bone is of the spongy variety, while further away the old bone is sclerosed and the medullary canal obliterated.

These appearances can only be explained on the assumption that the staphylococci, when they originally invaded the marrow, were at once walled in by granulation tissue, the elements of which succeeded in overcoming their pyogenic properties. As the vitality of the encapsulated cocci fell off, the granulation tissue was organised into connective tissue, of which the innermost layers became condensed into lamellæ of white fibres, while the outer layers proceeded to form bone. The irritation caused by the presence of the focus led to sclerosis of the surrounding bone and obliteration of the medullary canal.

As in the case of an embedded foreign body such as a bullet, the quiescent stage is not attended by any symptoms, and it may be prolonged for an indefinite period, and it is quite possible that the condition may never go further.

The mature stage or *stage of abscess* follows on the preceding by the lining membrane becoming again converted into granulation tissue and the serous contents transformed into pus, from which the *Staphylococcus aureus* can be isolated. While the granulation tissue lining the abscess cavity is being converted into pus, the outer layer, which is always being reinforced from the marrow, erodes the surrounding bone, and so causes the abscess to increase in size. If the bone is eroded at an equal rate in all directions, the resulting cavity is spherical or oval; and if new bone is formed at an equal rate on the periosteal surface, the girth of the bone is proportionately increased. If pus is formed so rapidly that accommodation is not provided for it by the erosion of bone, there is tension in the abscess, and this accounts for the paroxysms of pain which are so characteristic of the lesion. If the processes of pus formation and erosion of bone compensate one another, the pain disappears, hence the remissions which are equally characteristic. The pendulum may swing to and fro in this manner for long periods, cases having been recorded in which the characteristic symptoms of abscess were present for several years. Much more commonly, by the time the abscess has attained the size of a walnut the erosion becomes more active at some points, diverticula or tunnels are formed, and one of these finally erupts through the shell of the bone on the periosteal surface, or into an adjacent joint. Sometimes in operating for abscess one finds the cortex of the bone has entirely disappeared, and it is only necessary to incise the periosteum to allow the pus to escape. Small irregular sequestra are occasionally found in the interior of the abscess, attached to the wall or lying quite loose in the pus.

In the majority of cases the bone beyond the immediate vicinity of the abscess is sclerosed, and offers great resistance to the erosion by which the cavity is increased in size, a circumstance which explains the chronic nature of the lesion and the failure of nature to effect a cure. It is exceptional to find the bone cancellous throughout, as it was in the case illustrated in Plate X., Fig. 4, where so little hindrance was offered to the extension of the abscess that it perforated into the knee-joint within four months of the onset of symptoms.

The third stage of the lesion is that in which the abscess has perforated the shell of the bone, and the pus has discharged externally. The lining of the cavity reverts to a condition resembling that met with in the quiescent stage, without, however, its zone of newly-formed bone; it is represented by a thin fibrous membrane, permeated here and there by leucocytes on their way to the central cavity to become pus corpuscles. If the discharge of pus externally is sufficiently free, a state of equilibrium is established in which bone is neither formed nor removed, and in which there is neither any tendency of the cavity to increase in size nor to become filled up with new bone, and so undergo cure.

A most remarkable specimen illustrating this stage of the lesion is that presented to the Royal College of Surgeons of Edinburgh, in 1832, by Professor James Russell, and shown in Plate XI., Fig. 6. The cavity in the upper end of the tibia is large enough to contain 16½ oz. of fluid, and communicates externally by an aperture—rather more than 1 in. in diameter—which the patient controlled by means of a plug of wood surrounded by tow during the last twelve or more years of his life. It is on record that he was able to use the diseased limb nearly as well as the other, and upon occasion walked upwards of twenty-four miles in one day.[1]

If we contrast the condition of the bone around the abscess in the different stages, we find that in the first there is a progressive sclerosis; in the second an erosion, which sooner or later perforates the outer shell; and in the third, provided the pus escapes without hindrance, a state of equilibrium in which bone is neither added nor removed.

In discussing the conditions which determine the succession of the three stages of Brodie's abscess, it will be found that most interest attaches to the transition from the encapsulated or quiescent focus to the mature abscess.

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[1] "Catalogue of the Museum of the Royal College of Surgeons of Edinburgh," vol. i., by Charles W. Cathcart, F.R.C.S., p. 243.

Heinrich Gross,[1] in the course of an admirable paper on Brodie's abscess, does not credit the infective agents with an active share in this transition. He believes that the essential factor is to be found in the sequence of changes in the bone. "When the original medullary infection has been encapsulated by granulation tissue, there is still sufficient irritation to cause a reactive sclerosis in the surrounding bone. As this becomes more and more dense, the blood supply is proportionately diminished until the encapsulating granulations are obliterated, and the infective agents lose their virulence." The stage of latency, therefore, according to Gross, depends entirely upon a reactive sclerosis in the surrounding bone. When the process of encapsulation or "walling in" is complete, there is not sufficient irritation to maintain the sclerosis, and the process of condensation is succeeded by a process of rarefaction or porosis, according to the physiological law that when bone is formed in excess, it undergoes absorption when the stimulus which led to its formation is withdrawn. Sclerosis, therefore, is followed by rarefaction, the vascular channels are reopened, granulations re-form, fresh nutriment is brought to the infective agents, with the result that these rejuvenate and form pus; and the second or active stage of the lesion is entered upon.

Gross admits that his views are theoretical, but claims that they harmonise with and explain the clinical features of the affection.

No one is likely to dispute the association of sclerosis with latency, or of rarefaction with maturation of the abscess; the debatable point is whether these conditions of the bone are the cause or the effect of the successive phases in the life history of the encapsulated focus. In Gross's opinion they are the cause, and exercise their influence through the blood supply, in the first instance cutting this off until through loss of nutriment the vitality of the infective agents becomes a negligible quantity, in the second re-establishing the blood supply so that the vitality of the organisms is regained.

If the undoing of the sclerosis is to bring about a fresh supply of blood, the rarefaction must proceed from without inwards, until a stage is reached at which new vessels come into relation with the encapsulated focus. All the evidence at my disposal points to the rarefaction spreading from within outwards. Even in the latent stage, although there is dense sclerosis round about, the membrane which encapsulates the focus is surrounded by a zone of young bone in process of formation, the marrow of which is well supplied with blood vessels. In the active stage or abscess proper there is no doubt of the occurrence of rarefaction, but it commences in the wall of the abscess and spreads outwards. It is observed in operating for abscess that the cortical bone is often by far the densest and most deficient in blood vessels, while as the wall of the abscess is approached it becomes more vascular, and yields with less difficulty to the chisel or gouge.

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[1] Heinrich Gross, *Beitr. z. klin. Chir.*, Tübingen, Bd. xxx. S. 231.

It would appear that the cause of the transition from the latent to the active state is not to be found in the surrounding bone but in the focus itself, whereby the infective agents acquire the upper hand over the elements of the encapsulating membrane, causing its reversion into granulation tissue and the formation of pus.

It is the same struggle between the infective agents and the tissue elements as is observed in all infections and in all tissues, with a modification of details due to its occurrence in the marrow of bone. There is no evidence to show that the breaking out of the latent focus is due to a fresh infection from without.

It is to be borne in mind that Brodie's abscess is not the only form assumed by a pyogenic focus when it breaks into activity after a long period of quiescence. In other words, there are various forms of relapsing osteo-myelitis, all of which depend on the capacity of staphylococci to lie latent for long periods in the interior of a bone. It is impossible to explain why in one group of cases the relapse should take the form of a Brodie's abscess, in another of an osteo-myelitis resembling that which is met with in childhood, and in yet another of multiple acute abscesses throughout a bone terminating in general infection which may prove fatal.

The more important features in the *clinical history* of Brodie's abscess may be reviewed under the following heads:—

The frequency of an antecedent attack of osteo-myelitis.—In 145 cases in which the clinical history is sufficiently detailed to afford information on this head, I find a history of osteo-myelitis in childhood or youth in no less than 122 (84·2 per cent.). In the minority of these (twenty-eight cases) the attack was of a mild character, unattended with suppuration; in the majority (ninety-four cases) it was of the acute variety, attended with suppuration and the formation of sinuses, and in about half of them mention is made of the extrusion or removal of sequestra. There remain twenty-three cases (15·8 per cent.) in which a Brodie's abscess was the first clinical evidence of staphylococcal infection of the marrow—a small proportion, and one which would probably be reduced were all the facts obtainable. It is obvious that a mild infection of the marrow occurring in childhood may escape recognition; it may be misinterpreted as being of the nature of "growing pains" or rheumatism; and in the case of an adult there may be no one to tell of the ailments through which he passed during the first years of life. In contrast with acute osteo-myelitis, a

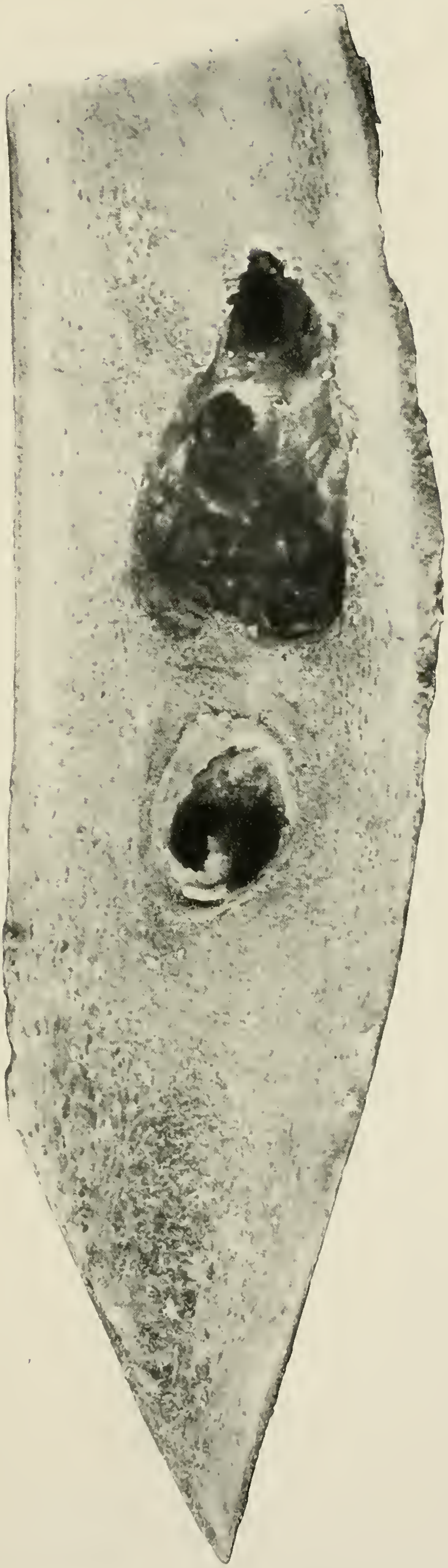


Fig. 1.

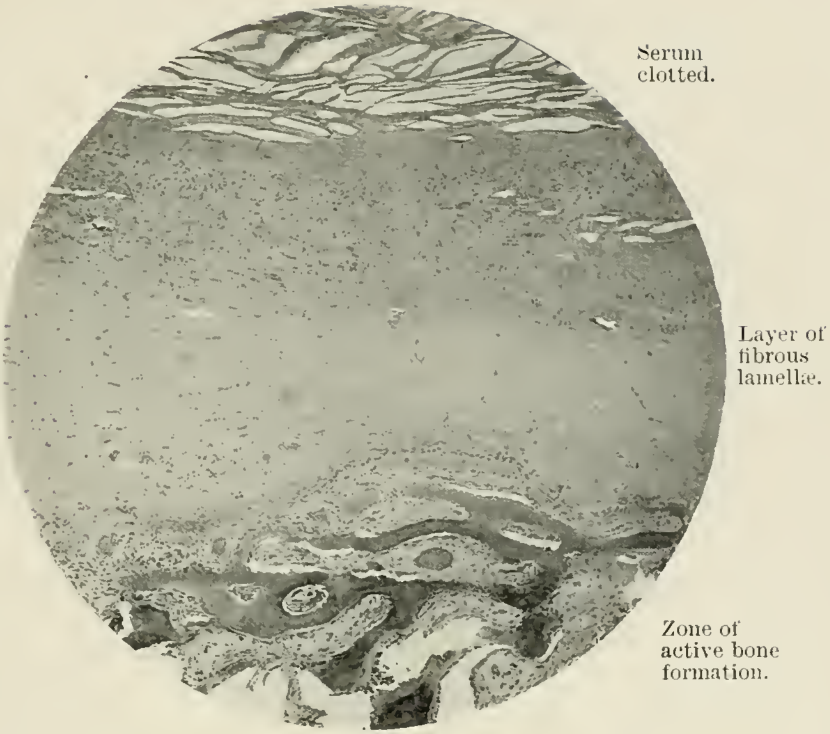

Serum clotted.
Layer of fibrous lamellæ.
Zone of active bone formation.

FIG. 2.

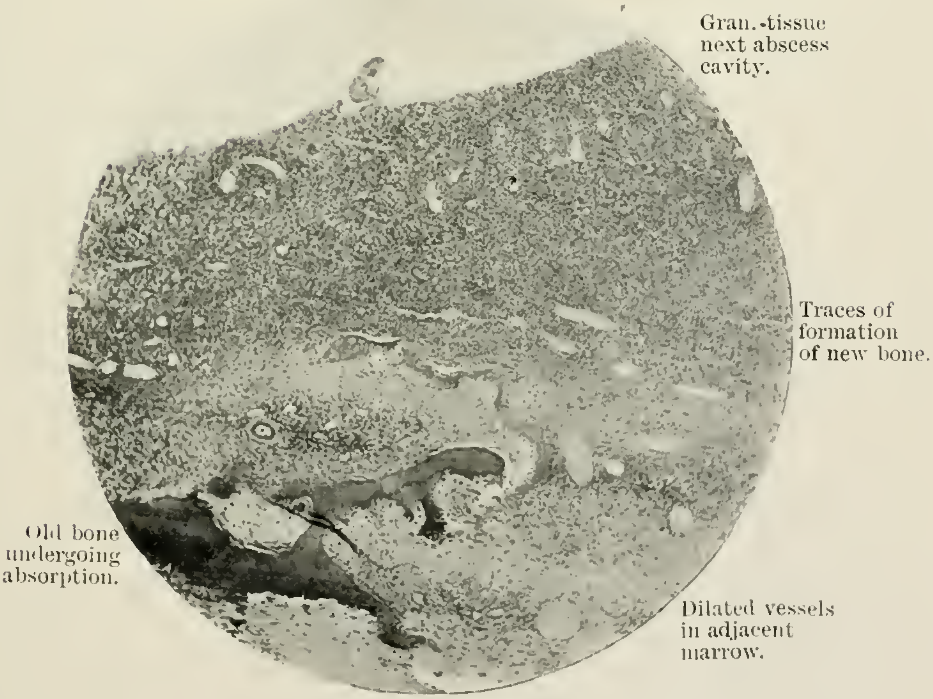

Gran.-tissue next abscess cavity.
Traces of formation of new bone.
Old bone undergoing absorption.
Dilated vessels in adjacent marrow.

FIG. 3.

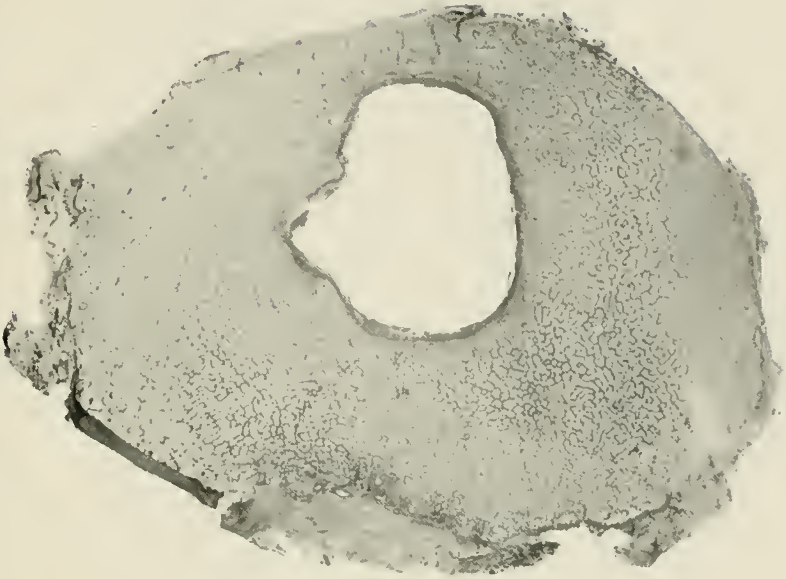
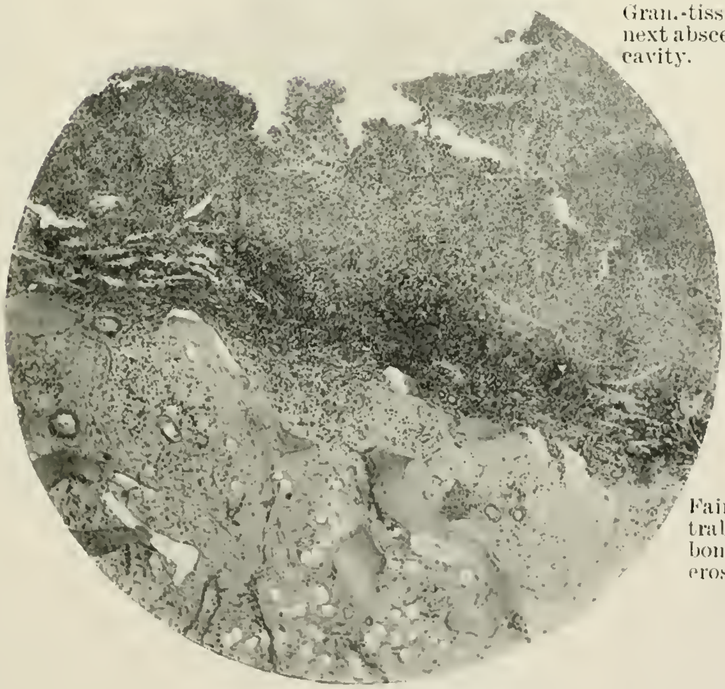
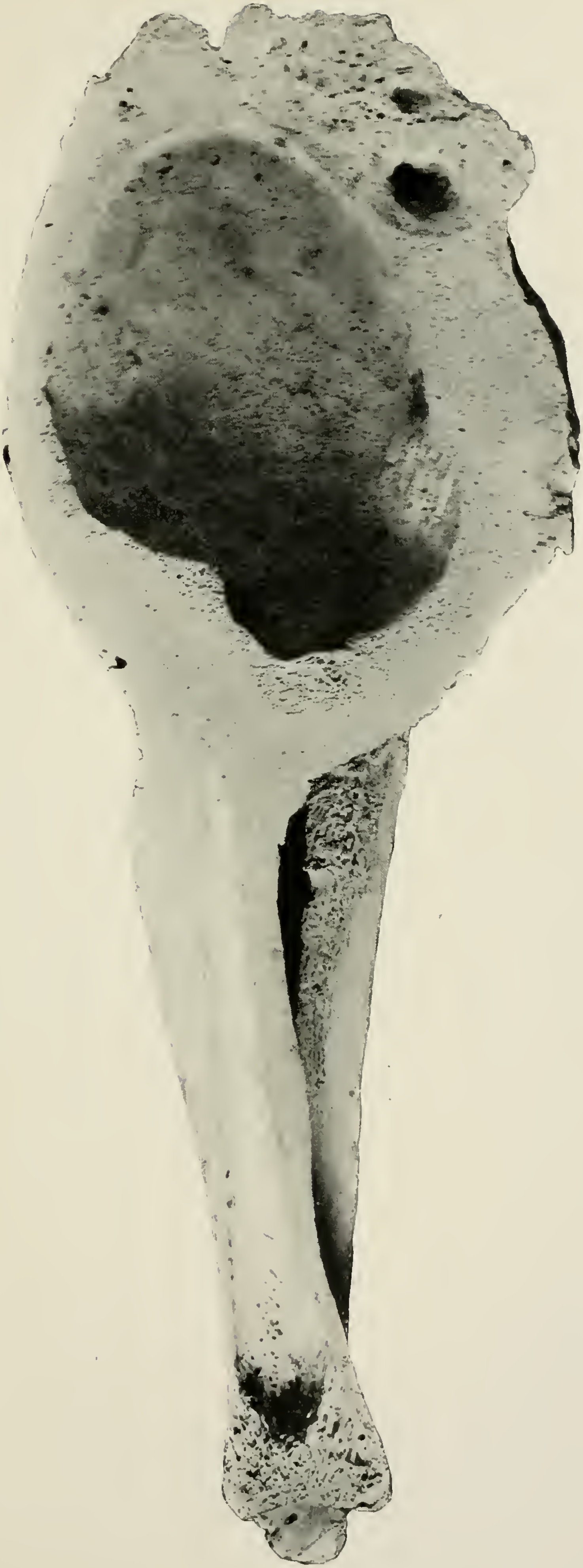


Fig. 4.



Gran.-tissue next abscess cavity.
Faintly stained trabeculæ of bone undergoing erosion.

Fig. 5.



mild attack rarely leaves any visible trace of its occurrence, although one does meet with cases now and then in which, although there has been no formation of pus, yet the bone is altered in shape or the adjacent joint stiff and contracted.

There is an interesting group of cases in which the original osteo-myelitis affects a different bone from that which subsequently becomes the seat of Brodie's abscess. In a case of my own, the left femur had been the seat of suppurative osteo-myelitis, and a Brodie's abscess developed in the right tibia some years later. What the proportion of individuals is who, having passed through an attack of osteo-myelitis in youth, retain dormant foci of infection in the marrow of the long bones, is an interesting subject for speculation, but the problem is one which is not likely to be solved. That many such foci exist and yet never come to fruition is as likely to be true as it is incapable of proof.

The *latent period* in the clinical history of Brodie's abscess is dated from the original attack of osteo-myelitis, and has ranged from one to fifty-seven years. There would appear to be some relationship between the severity of the antecedent osteo-myelitis and the length of the latent period, which I find averaged eleven years in mild cases, fifteen years in those attended with suppuration and sinuses, and eighteen years where there was suppuration and necrosis.[1] From this it might be inferred that an infection which culminates in suppuration either exhausts the cocci so that they take longer to recuperate, or that the suppurative process excites more vigorous reactive changes in the surrounding marrow, whereby the focus is walled in so securely that its rejuvenescence is deferred.

The situation of the abscess.—That the lesion owes its origin to an antecedent osteo-myelitis accounts for the fact that the abscess is met with in those parts of the skeleton which are most liable to suffer from osteo-myelitis. In 161 cases of abscess, the situation was as follows:—

Tibia—upper end	63
,, lower end	42
,, upper and lower ends	1
,, middle third shaft	2
,, level not stated	11
	119
Femur—lower end	18
Humerus	18
Radius	4
Ulna	2
	161

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[1] The paper by Heinrich Gross already referred to contains a tabulated list of 141 cases of Brodie's abscess, and numerous references to the literature.

The table brings out the marked pre-eminence of the tibia as the favourite site of Brodie's abscess, which, in view of the fact that staphylococcal osteo-myelitis occurs with about equal frequency in the tibia and in the femur, shows that there is some feature in the tibia which renders it more liable to harbour foci of infection.

The occurrence of abscess in the middle portion of the shaft of a long bone is exceptional. A good example met with in the tibia is shown in Plate X., Fig. 4, and my colleague, Mr. Dowden, has supplied me with another, occurring in the middle of the shaft of the humerus. Considering the frequency with which osteomyelitis originating at the ossifying junction spreads along the medullary canal, it is a matter for surprise that abscess is not met with more frequently towards the middle of the diaphysis. It must be assumed that in this latter situation the means of encapsulating an infective focus is rarely available, and the infective agents either bring about suppuration at once or die out altogether.

The typical seat of abscess is near the central axis of the bone in the region of the ossifying junction, where the marrow of the spongy bone is most successful in encapsulating the infective agents. When the bone has attained maturity and the epiphysial cartilage has disappeared, an increase in the size of the abscess is more likely to take place in the direction of the articular surface than towards the medullary canal, which is usually shut off by dense bone. The process of erosion whereby the abscess increases in size may lead to perforation of the articular surface of the adjacent joint, or of the cortex of the bone in the vicinity of the joint.

Factors which contribute to the ripening of the abscess.—It has been pointed out that when the latent focus becomes active, the encapsulating membrane reverts to the condition of granulation tissue, and this proceeds to eat away the bone, while the formation of pus in excess of the available accommodation brings about the characteristic clinical features. As is the case in other dormant infections, there are probably several factors which contribute to the recrudescence of a latent focus in bone. Gross and others have called attention to the fact that in one-third of the recorded cases abscess symptoms developed between the ages of 21 and 27, coinciding with the physiological maturity of the skeleton, when it may be assumed that the reactive changes around the infective focus become less active. Similarly, symptoms of abscess may make their appearance after depression of the general health, after strain of the affected limb as by prolonged standing and walking, after exposure to cold and wet, or after injury.

The clinical features harmonise with the gradual ripening and intermittent progress of the lesion, and are almost exclusively local.

Pain, due to tension within the abscess, is the dominant symptom. At first it is vague and difficult to localise, being then often regarded as "rheumatic"; later it is referred to the interior of the bone, and is described as "boring." Like all bone pains, it is usually worst at night, and, in the case of the tibia, is aggravated by standing and walking. For a time the patient may be entirely free from pain, able to go about as usual, then without apparent cause it returns in full force. The free intervals sometimes extend to several weeks or even months; but as the abscess matures the tendency is for them to become shorter and shorter until the pain becomes continuous.

The only other features of abscess which are at all constant are local tenderness and interference with the function of the limb. The tenderness is circumscribed to the segment of bone containing the abscess, and is best elicited, in the case of the tibia, by percussing the bone with the finger on its subcutaneous aspect. In the case of a more deeply seated bone, the tenderness is elicited on grasping it between the fingers and thumb. Disturbance of function may proceed from the bone or from involvement of the adjacent joint. When the affected part of the bone is pulled upon by a muscle or tendon attached to it, or strained by the weight of the body, there is a loss of power which, in the case of the lower extremity, gives rise to a limp in walking. In abscess of the tibia exacerbations of pain and a limp are frequently associated, disappearing for a time, and then returning together, not at all unlike what is observed in the early stage of tuberculous disease of a joint.

Circumscribed swelling of the shaft of the bone is only met with in advanced cases, when the abscess has approached near enough to the surface to excite reactive overgrowth by the periosteum; the swelling is firm and hard, and, in the case of a subcutaneous bone, the skin over it is tense and tacked down. If the abscess be seated in the middle third of the shaft, the swelling is fusiform.

Involvement of the adjacent joint is a common complication, and is liable to lead to errors in diagnosis. It may date from the original attack of osteo-myelitis, in which case it assumes the form of fibrous or bony ankylosis, or merely a contracture from shortening of the peri-articular structures, usually those on the flexor aspect. It may proceed from the abscess itself, in which case it is of recent development, and may assume different forms. The hollows about the joint may be filled up as in an early tuberculosis of the synovial membrane; more commonly there is an intermittent hydrops which comes and goes coincidentally with the exacerbations of pain, while in some cases there is a sudden onset of acute arthritis due to perforation through the articular cartilage into the joint. I have found notes of twenty cases in which the adjacent joint was implicated; the knee in twelve, the ankle in six, and the shoulder in two. An abscess in the lower end of the femur more frequently implicates the knee-joint than one in the upper end of the tibia. In sixty-two cases of abscess in the head of the tibia the knee was implicated in five; while in eighteen cases of abscess in the lower end of the femur the knee was implicated in seven.

Pyrexia is occasionally discovered if the temperature be systematically taken, but is often absent. Loss of flesh and appetite are due chiefly to the persistence of pain and want of sleep. The formation of an abscess in the soft parts overlying the bone is occasionally observed. When it bursts and discharges, the pain of the bone abscess is often relieved, even although on exploration no communication with the interior of the bone can be discovered. The symptoms are entirely relieved if the pus in the bone escapes freely.

Bacteriology of Brodie's abscess.—The *Staphylococcus aureus* is nearly always found pure and active, and has been met with when the abscess developed as long as fifty years after the original osteo-myelitis (Kurt Müller). In one of my own cases the *Staphylococcus albus* was the only organism found.[1] In cases which date from an attack of enteric fever, Eberth's bacillus may be found either in pure culture or along with the *Staphylococcus aureus.*

Skiagraphy in Brodie's abscess.—When the sclerosis around the abscess is extensive, the shadow is uniformly dark, and no positive information is afforded, although such a uniform shadow may serve to exclude the other lesions—tubercle, gumma, hydatid, and sarcoma—which are liable to be confused with central abscess. In a considerable number there is a lighter area in the centre of the dark shadow, which is of value not only in confirming the diagnosis, but in enabling the surgeon accurately to localise the abscess for therapeutic purposes. The central light area is less well defined than it is in a tuberculous focus, in a gumma, or in a central sarcoma. In the shaft of a long bone, the black shadow of the obliterated medullary canal *above* and *below* the lighter area which corresponds to the abscess is quite characteristic.

Shadows which are difficult to interpret are obtained in cases in which the abscess is situated in a bone whose architecture has been distorted by an antecedent attack of osteo-myelitis, especially one attended by suppuration and necrosis.

The differential diagnosis of Brodie's abscess from other affections met with at the ends of long bones is made by a consideration of the previous history of the patient, especially with reference to an antecedent attack of osteo-myelitis and of the clinical evidence. Recourse should be had also to an examination with the X-rays. When the adjacent joint is implicated, the surgeon may be misled by the patient referring his symptoms to the joint rather than to the bone.

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[1] By my colleague, Mr. Henry Wade, Conservator of the Museum, Royal College of Surgeons, Edinburgh.

Treatment.—If an abscess is suspected, there should be no hesitation in exploring the interior of the bone. It is exposed by a suitable incision, and the periosteum reflected; the bone is opened up by a gouge or trephine, and the presence of an abscess may be at once indicated by the escape of pus. If, owing to the small size of the abscess, or the density of the bone surrounding it, the pus is not reached by this procedure, the bone should be drilled in different directions. The pus and any dead bone having been cleared out, the cavity is scraped, disinfected, and packed. The packing is changed at intervals until healing takes place from the bottom. It is not essential that the patient be confined to bed after the first two or three weeks.

If the adjacent joint is ankylosed in an undesirable attitude, this should be corrected at the same time that the abscess is opened or on a subsequent occasion.

DESCRIPTION OF PLATES VIII.—XI.

Plate VIII.

Fig. 1.—Sagittal section of middle two-thirds of shaft of tibia of a boy æt. 15, showing two cavities, the upper a mature Brodie's abscess, the lower the quiescent stage of the same lesion. There is diffuse sclerosis and obliteration of the medullary canal.

Plate IX.

Fig. 2.—A section of wall of quiescent focus showing thick láyer of fibrous lamellæ on free surface, and deeper zone of active formation of new bone. (× 30.)

Fig. 3.—A section of wall of mature abscess showing layer of granulation tissue on free surface, and erosion of bone in deeper layer. (× 30.)

Plate X.

Fig. 4.—A horizontal section of head of tibia showing mature abscess in the interior of the bone. Photographed, natural size, from a section cut in paraffin by the author.

Fig. 5.—A section of wall of abscess in head of tibia shown in Fig. 4, and magnified 30.

Plate XI.

Fig. 6.—Section of a right tibia, with fibula attached, showing enormous abscess in upper end of tibia.—Museum of Royal College of Surgeons, Edinburgh.

CHRONIC BRONCHITIS AND ADIPOSITY.

By G. A. Sutherland, M.D., F.R.C.P., *Physician to the North-West London Hospital, and to Paddington Green Children's Hospital.*

Chronic bronchitis is usually the sequel to one or more attacks of acute bronchitis. Certain cases respond very badly to treatment, and certain factors play an important part in maintaining the chronicity of the disease. One of these factors is adiposity. In confining my remarks to this factor, I do not wish to be understood as ignoring or undervaluing other causes and other forms of treatment, or as asserting that chronic bronchitis may not occur in thin persons. These other matters are discussed very fully in the text-books, but the subject of an excess of fatty tissue does not seem to have received the attention it deserves, although its importance is recognised by many medical men.

We find clinically that a very common history in a bronchitic patient is as follows: Some time after passing the age of forty, he or she began to get stout. With the increasing stoutness it was noticed that an ordinary cold, which formerly did not pass beyond the naso-pharynx, had a tendency to affect the bronchial tubes. There was also an increasing frequency about these colds. Later, the ascent of a slight incline produced a shortness of breath, to which the patient had been previously unaccustomed. Then, even on a level road, the rate of walking gradually became slower and slower, and, as the result, the amount of daily exercise became considerably diminished. There was also noticed a slight or marked wheeze about the chest, along with a shortness of breath on any exertion, even talking, and at night a desire to have the chest propped up to secure easy and quiet breathing. Perhaps no more acute symptoms had developed, or, it may be, that a run to catch a train had produced an attack of acute and alarming dyspnœa. On examining a patient with such a history, we shall often find the signs of chronic bronchitis. The heart is difficult to define from the mass of fat in the chest wall, but there are no evidences of cardiac degeneration, or of valvular disease. The pulse is regular and good when the patient is at rest, and the arteries and kidneys appear to be healthy.

Now, consider the association between the increase of fatty tissue and the bronchitis. With the development of fat, the peripheral resistance to the flow of blood has been much increased. The difficulty in the circulation is not in the arteries or in the arterioles but in the capillaries, which are generally increased in number, and are everywhere surrounded by this soft resistant fat. The pressure exerted by the dense masses of fat on the capillaries hampers very much the flow of blood through these vessels. The result is that the venous pressure is lowered, the propulsive power of the heart being dissipated in driving the blood through the capillaries, and the blood returns to the right heart with difficulty. Thus the task of the right ventricle is not made easier, the pulmonary circulation is imperfectly carried out, and a catarrhal condition is readily set up. Further, it is not only the peripheral regions of the circulation that are affected; for, as regards the central organ, we find that the fatty deposits in and around the heart mechanically interfere with its action. This will tell more especially on the thin-walled right ventricle, which has no great reserve of power, and a more or less stagnant condition of the pulmonary circulation will follow. When a process of fat accumulation is going on, the oxidation of the tissues is not complete, and the blood contains an excessive amount of carbonic acid. This excess of carbonic acid does not facilitate the flow of blood in the system generally, and for its removal it demands more especially an active pulmonary circulation in order to get rid of the excess through the normal channel—the lungs. The excess of carbonic acid will directly lead to further stagnation of blood in the lungs and a catarrhal condition of the tubes. Summing up these changes in stout people, we find—(1) Vascular obstruction from increased peripheral resistance in fatty tissues, (2) cardiac weakness from deposit of fat about the heart, and (3) pulmonary obstruction from excess of carbonic acid in the blood. These factors will directly tend to the production of bronchitis, more especially under the atmospheric conditions which prevail in this country during the winter months. Dr. Harry Campbell has considered the question most thoroughly, and has pointed out that not only may adiposity lead to bronchitis, but that the converse holds true. "The typical elderly bronchitic is stout: he is stout because he is bronchitic, and he is bronchitic because he is stout: there is a vicious circle. Thus, assuming an elderly person to become bronchitic, what happens? He does all he can to save his breathing and his heart: he takes little exercise, because exercise causes breathlessness; and this sedentary life promotes stoutness, which is still further favoured by defective oxygenation consequent upon the bronchial trouble and upon the sluggish circulation from which all bronchitics tend to suffer. Hence it is that bronchitis tends to induce obesity, especially when it occurs during the period of elderliness, which is *par excellence* the period of obesity."[1]

As regards the treatment of such cases I shall only consider the factor of adiposity. One can make chronic invalids of these patients—a fate which some of them take to very kindly—or one can send them to winter abroad, with great benefit temporarily to the symptoms. But if one wishes to make a cure, the first and the essential thing is to remove the excess of adipose tissue. It may be taken for granted, without making any objectionable inquiries, that too much food is being taken, and this is usually in the form of carbohydrates and fats. When we say too much we mean too much for the individual, for many a thin person will eat far more than the adipose subject. We must therefore mercilessly cut down the amount of carbohydrates and fats. The lines of procedure which will be found simple, safe, and efficient are—(1) A lean meat diet, (2) a saline aperient in the morning, and (3) water to drink freely between meals.

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[1] *Brit. Med. Journ.*, London, 1901, vol. ii. p. 1063.

First, as regards the lean meat diet. There should be three meals a day, selected from the following—beef or mutton plainly cooked, chops, steak, fish, game, fowl, kidneys, tongue, and veal. These are to form the main part of the dietary, and the patient must partake of them in moderation, so as to avoid the evils of an excess of nitrogenous food in the system. If signs of indigestion or gastric discomfort appear, he has probably been partaking too freely. In addition, he may be allowed at each meal two small pieces of dry toast, or two breakfast biscuits, or two tablespoonfuls of dinner biscuits; at one meal a tablespoonful of spinach or other green vegetable, and at another meal a raw apple. One cup of tea or coffee, or one claret glassful of water, with ½ oz. of whisky or brandy if desired, represents the amount of fluid allowed with meals. This may be called the rigid dietary, which is modified according to the progress of the patient.

Secondly, a dose of Apenta or Hunyadi water or a small seidlitz powder should be taken every morning, and taken in as concentrated a form as possible. The over-dilution of the saline diminishes the promptness of its action. One good evacuation daily is sufficient.

Thirdly, while the amount of fluid taken at meals is strictly limited, we encourage the patient to drink at other times from one to two pints daily. Plain water is as good as any other, but soda or potash water may be taken if preferred, and if the urine contains much uratic deposit, Coutrexville water may be ordered. The excretory organs will carry off the superfluous tissues more rapidly if supplied with plenty of plain fluid.

The result should be a loss in weight of from two to five pounds weekly—more is not desirable, and less is not efficient. The patient will describe certain other results from his own observation. As regards the dietary, he will complain that it produces in him a constant feeling of hunger. This is interesting as showing what a large share in satisfying hunger the bulk of food consumed takes. As a matter of fact, he is taking much less in bulk, for bread and vegetables and puddings form the largest part of the ordinary food supply. We can assure him that he is taking a most nourishing diet, and that the constant feeling of hunger implies a good digestion. He will also in a short time report the disappearance of the chronic wheeze, and of the shortness of breath on exertion, and an increased power of walking up a slight incline. He may, or his doctor may, become anxious as to the effect of this diet on his gout, for many of these patients are gouty, or are believed to be. So far I have not seen any bad results even in the goutiest of patients. As a matter of personal experience, I have found that "gouty bronchitis" in a fat subject usually turns out to be fatty bronchitis in a gouty subject. Finally, he will say that he misses his wine, the champagne or port, or other wine which has been ordered him as "strengthening." He may be assured that his diet is a sufficiently strengthening and stimulating one, and that alcohol will only increase the tendency to pulmonary catarrh. I believe that in the case of bronchitic subjects, be they stout or thin, alcohol never benefits the pulmonary catarrh, and very frequently aggravates it. The severe proteid regimen does not require to be persisted in for the rest of the patient's life. What must be insisted on is that for the future his meals should be moderate in amount, and that the carbohydrate element especially should not be in excess.

Passing to another period of life, we find in the present day that rickets and chronic bronchitis are very common amongst the infantile population. Many children are described as "cutting their teeth with bronchitis." We shall find that as a rule these infants are fat and flabby, and that a large amount of carbohydrate, usually in the form of some patent food, has been present in the diet. While catarrh of the mucous surfaces is induced under slight provocation in rachitic subjects, it is probable that another and an important factor in the bronchitis of infants is the excess of adipose tissue. The same reasons for this apply as in the case of adults. If the chief agent in the production of surplus fat, namely, carbohydrates, be eliminated from the diet, and a moderate amount of milk and cream be the sole food, it will probably be found that the bronchitic tendency will soon pass off.

ABDOMINAL HYSTERECTOMY FOR ACUTE PUERPERAL METRITIS AND ACUTE SALPINGITIS, WITH RECORD OF A SUCCESSFUL CASE.[1]

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THE question of operative interference in puerperal infection is a very difficult one in many instances, and at the same time it is one of the highest importance. It is indeed comparatively seldom that one would be justified in performing hysterectomy in such cases, and yet there are occasions, as in the one I am about to record, where life can be saved by the procedure. Schultze, in 1886, laid down definite indications for hysterectomy in puerperal fever, as follows:—(1) There must be present in the uterus an active source of infection which cannot be successfully dealt with through the genital canal; (2) there must be no imminent source of infection elsewhere than in the uterus; and (3) the existence of foci of septic infection, such as thromboses or emboli, already deposited more centrally, should be improbable. In other words, as Fehling has pointed out, one must clearly distinguish between sapræmia or intoxication, and general infection, in considering the question of hysterectomy.

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[1] Read before the Edinburgh Obstetrical Society, 14th March 1906.

In general septicæmia the mere removal of the uterus alone can do no good unless in exceptional cases, as where there is co-existing uterine phlebitis, where hysterectomy might be combined with ligature or excision of the thrombosed veins in the broad ligaments, and possibly also the hypogastric veins. On the other hand, in the comparatively rare cases where the focus of infection is limited to the uterus, and where such foci are not otherwise accessible, the indications for hysterectomy are clear, for instance in sloughing and suppurating fibromata, in uterine abscess (which can never be diagnosed with certainty before operation), in the very rare cases where decomposing placental tissue cannot be completely removed per vaginam, and also in cases where a septic uterus has been perforated by a curette, or in criminal abortion.

Of course, one may say that in practically all cases of infection which are seen sufficiently early, the focus is confined to the uterus, but one could never go the length of suggesting that therefore all such uteri should be removed at once. If this were conceded, many (if not most) such uteri would undoubtedly be removed unnecessarily, as with prompt medical treatment and less severe local measures, about 90 per cent. of such cases should recover. On general principles, of course, it might be argued that so far as hysterectomy is concerned, the earlier it was done the better its chance of success, not only because the focus was more likely to be limited, but the patient's strength would not be too greatly exhausted by continued fever and septic poisoning.

There can be no doubt that the best results all round are got, not from operating early (unless in exceptional cases with special indications), but by operating only after all other treatment has failed or is failing.

In those very acute cases of poisoning which die in a few days (happily rare now), probably nothing that could be attempted could possibly save them, as, in addition to the virulence of the poison, some important organs, such as the liver, kidneys, brain, or heart, are probably seriously implicated almost at once.

Unfortunately, neither examination of the blood nor of the secretions from the uterus can give certain information as to whether hysterectomy is indicated or not. We must base our decision more on the general condition of the patient, on careful local examination, and on the fact of no benefit arising from the ordinary routine treatment. Possibly a final decision cannot be arrived at till after the abdomen has been opened. Of course one can get much valuable help from a leucocyte count and the glycogenic reaction, diagnostic aids which were fully dealt with in an interesting paper by Dr. Scott Carmichael, read before this Society in November 1903. In the discussion which followed this paper, Dr. Gulland pointed out that when there was general septicæmia and a low leucocyte count, it meant that the patient was overwhelmed, and in such a case it was inviting disaster to operate. In localised suppuration it was usual to find the reverse, namely, a high leucocyte count, a high polymorphonuclear range, and marked glycogenic reaction. Grandin has pointed out that in his experience an empty uterus with a low temperature, and a rapid pulse that is out of proportion to the thermic rise, suggests streptococcus infection as in the ascendant; whilst the presence of fœtid discharge, the finding of remnants of necrosed secundines in the uterus, together with high pulse and temperature, suggest the prevalence of the sapræmic type of infection,—this latter condition being more an indication for hysterectomy if other treatment has failed.

Vineberg believes that 95 per cent. of cases of puerperal sepsis nowadays met with, where the original infection is in the uterus, can be cured by curettage, drainage, and irrigations. He points out that Bumm's granulation zone only exists in simple cases where the septic intoxication is localised in the uterus, and that it is not present in cases of general sepsis. In the remaining 5 per cent. such treatment will fail, the symptoms will persist, and consequently an exploratory laparotomy is indicated; the further course to be guided by the lesions found. He finds that in such cases total hysterectomy will generally be necessary.

In this connection I would here mention that personally I prefer the finger to using a curette in a puerperal uterus.

In general peritonitis, on the other hand, the indications are for opening the abdomen, thoroughly searching for all foci of suppuration, and draining the cavity through the vagina. I strongly feel that this procedure, if more universally adopted, would yield good results in many apparently hopeless cases. Of course hysterectomy can be done at the same time if the uterus shows evidence of being a focus of infection. The vaginal route is to my mind indicated only where there is a distinct localised and fixed pelvic abscess to deal with, and where, therefore, it is a simple matter to evacuate the pus and drain through the vaginal roof. One may drain the abscess abdominally also. In all other cases the abdominal route should be the one of selection, as enabling the operator to judge clearly of the condition, and rationally to cope with any foci of infection which may present themselves. Subsequent washing out and drainage should be carried out through an opening made into the vagina through Douglas's pouch.

The friability of the puerperal uterus renders vaginal hysterectomy in such circumstances extremely difficult, and therefore it should not be undertaken.

The mortality in maternity hospitals in pronounced puerperal sepsis, according to Ricard, is somewhere about 10 per cent. with ordinary routine treatment. In Dresden the mortality from puerperal sepsis in the Frauenklinik is said to be 50 per cent. The apparent disparity in these statistics appears to me to be due to indefiniteness and confusion as to what really constitutes puerperal sepsis. In all likelihood half of this 10 per cent. mortality could be prevented by surgical interference, either by drainage or hysterectomy, as, so far as one can judge from recorded cases, fully 50 per cent. of the cases of puerperal infection operated on recover, and these are probably the very worst and most severe cases, all of which would have died under ordinary routine treatment.

Apart from mortality, morbidity would probably be greatly lessened by timeous surgical intervention in suitable cases.

What I would plead for is that in all cases of puerperal infection which have resisted ordinary treatment, where the patient's condition is getting worse, where there is no cellulitic abscess which can be evacuated and drained through the vagina or abdomen, an abdominal section should be performed and the subsequent procedure determined according to the condition found,—if general peritonitis, thorough washing out and vaginal drainage; if the uterus is affected as a focus, do a complete or partial hysterectomy, or remove a tubal or ovarian abscess, combined also with vaginal drainage if necessary, and possibly with abdominal drainage as well. If the uterus is uniformly affected, it must either be removed completely or let alone. I feel convinced that some lives, otherwise hopeless, could be saved in this way. Hysterectomy one would therefore regard as a very exceptional treatment in puerperal cases, nevertheless there is a distinct though restricted field for its use. In opening the abdomen in puerperal peritonitis, one should always be prepared for a possible hysterectomy.

The following is an account of a case where I recently removed the puerperal uterus with successful result. I am indebted to Dr. Strain, the House Surgeon at Leith Hospital, for the notes of the history.

"Case.—Mrs. H. B., æt. 25, was admitted to Leith Hospital on 16th February 1906. She was sent in from Pilton Hospital, where she had been conveyed earlier in the day as a case of acute puerperal infection, by directions of a medical man who had been called in to see her. She is a housewife, and has been married for eight years. She has had six children, the first born seven years ago, and the youngest is æt. 3 weeks. She has had no miscarriages. She has had no trouble with any of her labours till this last one. She had twins in her first confinement (two boys), one of whom died, æt. 10 months, and the other is still alive. All the other confinements were natural. She nursed all her children. She was in the habit of getting up on the eleventh day of the puerperium, and always felt quite fit for her work by that time.

"*Present history.*—The patient was confined of her last child on Monday, 29th January last. Labour pains began about 2 P.M. that afternoon, and the child was born naturally at 2.40 P.M. The pains were never very severe, and the patient says this was the shortest and easiest labour she has had. The child was a female, and is alive and healthy. The midwife was sent for, and arrived about 2.30 P.M. Only two vaginal examinations were made before the child was born, but there was considerable difficulty with the after-birth, which, however, came away about half an hour after the birth of the child. There was a fair amount of hæmorrhage during the third stage of labour. About four days after confinement, the patient began to feel slight pain in the right side, which was pretty constant but always bearable. She also noticed a swelling on the right side, which she complained about to the midwife, who told her it would soon disappear. She got up as usual on the eleventh day, and felt fairly well, going about her household duties much as usual. She continued to go about, never, however, feeling quite well, for a week, and then on the morning of the 16th February she had a rigor with severe pain in the right side. She then sent for a doctor, who found her condition serious, and advised her removal to Pilton Hospital for infectious diseases. She was removed there about noon on that day. While in Pilton Hospital she had hot fomentations applied to the abdomen, and some medicine was administered by the mouth. About 8 P.M. the same night (16th February) she was transferred to Leith Hospital as a case of general peritonitis. The chart sent from Pilton showed the temperature to be 102° F. and the pulse 130 when taken there.

"On admission to Leith Hospital the temperature was 100° F. and the pulse was 120. She had a dull toxic appearance, and was evidently suffering severe pain. The abdomen moved fairly freely with respiration, and was not generally rigid. In the right iliac fossa there was a very tender firm mass, which extended down to the pelvis. No fluctuation could be detected abdominally. Patient had never complained of any sickness or vomiting, but she had very little appetite for food for some days previous to admission.

"Per vaginam, a large firm mass was felt lying to the right of the uterus. The mass was movable, and very indefinite fluctuation could be felt. The uterus was enlarged and tender on palpation. There was slight sanguineous vaginal discharge, which had a heavy odour on admission, but after a vaginal douche and external cleansing there was no further odour, and the discharge was comparatively trifling. The patient felt rather better on admission than she had done for some days, and consequently refused to have anything done to her, even the intra-uterine douche. Next day she was seen by Mr. Miles, in whose ward she was, and he recommended her to be transferred to Dr. Ferguson's care. For the next two days she improved considerably, the temperature coming down to normal and the pulse to 88. Her appearance, however, was not good, and she had the drawn, pallid, earthy look of a bad abdominal case. She still, moreover, complained much of abdominal pain, chiefly on the right side, but to some extent on the left side also. Her bowels were constipated. On examination of her blood, she had a leucocytosis of 24,000, the blood film showing the increase to be almost entirely polymorphic. No organisms were to be found in the blood.

"On the 19th February she was examined carefully under chloroform. The uterus was found enlarged fully two fingers'-breadths above the pelvic brim, and empty, and there was a large movable swelling in the right fornix, apparently attached to the uterus, which was also movable. Definite fluctuation could not be made out, and Dr. Ferguson decided to open the abdomen, after waiting for a day or two to try to get her into better condition with strychnine, rest in bed, and feeding up. There was no evidence of appendicitis, and the provisional diagnosis was a possible right pyosalpinx. On the 21st February the patient was not so well. She complained of sickness, and vomited green bilious fluid several times, and the abdominal pain became very severe. The temperature had been 102°·4 F. through the night, and the pulse 128, but both had fallen somewhat in the morning—the temperature more than the pulse. The pulse, moreover, was soft and compressible, and the patient's whole general appearance was such as to give great anxiety. Dr. Ferguson saw the patient in the forenoon, and decided to operate that afternoon."

Operation.—I accordingly opened the abdomen in the middle line, and found the intestines and omentum matted together, especially on the right side, by extensive recent adhesions. On separating these, some of which were very vascular, I found some fluid imprisoned by the adhesions in the right side of the pelvic cavity; the omentum was also greatly thickened and apparently œdematous. There was no general peritonitis, as the inflammatory condition did not extend above the umbilicus, was chiefly on the right side, and was shut off entirely from the rest of the peritoneal cavity by the adhesions. On getting down into the pelvis, I found a piece of thickened inflamed omentum firmly adherent to the right cornu of the uterus, and on separating this the uterus at that spot presented the appearance of gangrenous inflammation, especially over two very definite areas. The right Fallopian tube was in a condition of acute inflammation. Clearly, the only thing to be done was to remove the uterus, and that as quickly as possible, as the patient's weak condition demanded rapid measures. As the mischief appeared to be limited to the upper part of the uterus, and as the cervical end seemed healthy, I decided to do a supra-vaginal hysterectomy, which I thought I could do more quickly. I accordingly rapidly carried out this procedure, and, after shutting off the cervical stump from the general peritoneal cavity by sewing the peritoneal flaps over it in the usual way, I made an opening through the pouch of Douglas into the posterior fornix vaginæ, and thoroughly washed out the peritoneal cavity with sterilised water, having previously passed a large rubber drainage tube through the pouch of Douglas into the vagina. The patient was back in her bed in about three-quarters of an hour, and though her temperature swung slightly for a day or two, she practically never had a bad symptom after the operation. By the fifth day her temperature and pulse were normal, she was taking her food with relish, and having good sleep. She is now looking and feeling extremely well. I left the drainage tube in the pouch of Douglas for five days. I ought to mention that a small stitch-hole abscess developed in the lower end of the wound, which, however, quickly closed up.

I append the report on the uterus by Dr. Ritchie, pathologist to Leith Hospital. Dr. Ritchie did not get the specimen in its fresh condition, but only after it had been hardened for some days, and was thus, unfortunately, prevented from making a bacteriological examination.

"Over the fundus uteri there is considerable peritonitis, and especially over the right cornu. The inflammation appears to be of some duration, for on microscopic examination the fibrinous deposit is seen to be undergoing vascularisation. In the muscular wall of the uterus, below the peritoneal inflammation, there are several small abscesses, each about the size of a small pea—not exceeding $\frac{1}{2}$ cm. in diameter. There were no abscesses found in the wall of the uterus elsewhere.

"There is acute inflammation in the right broad ligament around the Fallopian tube. The tube itself is not dilated, and its mucosa is healthy. The left tube and broad ligament are normal in appearance.

"The endometrium presents no signs of acute endometritis."

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URIC ACID AS THE CAUSE OF GOUT AND GOUTY CIRCULATION.

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IN the *Practitioner*, London, of January 1906, appeared three articles dealing more or less directly with the subject of uric acid and its treatment by diet. My time is little at my own disposal, and the first impulse was to leave the opinions I have formed to the demonstration of events; but since it is evident that the assertions in these articles could have been made only by those unacquainted with the results obtained by myself and other workers in this field,—and they are therefore typical,—I propose to state the more important facts, using a simple tabular form to illustrate the points discussed. They admit of a simple explanation, and the difficulties arising from them can be as easily dispersed. Particulars can thus be given of the capillary circulation, blood pressure, temperature, and blood quality of three average persons, with the corresponding amount of uric acid presumably present in their blood and urine. The first represents a sufferer from gouty depression, with insomnia, lethargy, etc.; the second, a meat-eater in what usually stands for normal health; and the third, a man who has had two or three years on the uric-acid-free diet, and has got rid of most of the previous accumulations of uric acid.

Table.

	Capillary Reflux in Half Seconds.	Blood Pressure. Millimetres of Mercury.	Temperature.	Blood Decimal (or worth).	Uric Acid in Blood (Granules to Red Cells).	Uric Acid in Urine.
1. Collæmia, with depression, insomnia, lethargy, etc.	8–10	160–180	97–97·6	·7–·8	1–5 to 1–1	25 grs. per day and more.
2. Ordinary meat-eater.	6–8	140	98	·8–·85	1–10	18–20 grs. per day.
3. Uric-acid-free dieter for two to three years.	5–6	100–120	98–99	1·00–1·15	1–20	10–11 grs. per day.

This table, which summarises my notes of many such cases, speaks for itself, and I may add the definite statement that the meat-eater, with invariably more (generally twice as much) uric acid in blood and urine, never has so quick a capillary circulation, so normal a blood pressure, so good a temperature or blood value, as the man on the uric-acid-free diet. Yet so little is this occasioned by idiosyncrasy, that conditions thus produced can be reversed, and the indications distinguishing the meat-eater be transferred to the uric-acid-free dietist, by the administration of given doses of pure uric acid.

Uric acid can thus be demonstrated a poison by its effect upon the circulation, and I demur to the statement that those who habitually take its equivalent in meat and tea are in a natural or healthy state. In an experience now comprising many years and innumerable cases, I find them inevitably below normal in the particulars cited. They offer, at the best, specimens of the conditions numbered "2" in my table, and I have never found one who touched the standard of "3." I will not linger over these propositions, which really require only a few hours' work for their proof, but will pass to some of the statements which I controvert. It is easily understood that for persons having no practical acquaintance with the solubility of uric acid in the blood, and who have not in practice verified the facts already given, the subject may present a baffling problem, and conditions of the complexity frequently dwelt upon in these three articles. In many of the cases instanced, details are correctly observed, but inferences incorrectly drawn, because results already obtained are not known or comprehended. On the other hand, it is stated that "the all-pervading teaching of the present day is that uric acid comes exclusively from certain proteid foods." This is as encouraging as it is true, for the uric acid turnover can certainly be diminished one-half by the exclusion of these foods, and the patients there classified as "unfortunate" may have their own opinion as to their fortune when they have gained a normal temperature and circulation and a super-normal blood worth by this simple method. Super-normal, for the accepted standards of blood worth are those of meat and tea takers, and some 10 or 15 per cent. too low for persons who have adopted a diet free from the purins.

Patients indeed there are, who, in altering diet, begin a course of under-feeding, and continue to pass excess of uric acid in the urine. But this is to be expected, for the 600 to 800 grs. probably stored in the tissues will certainly be excreted as introduction ceases. Starvation is equally wrong and unnecessary. A blood value of 1 to 1·15 cannot be produced on deficient albumins, even if those albumins are uric-acid-free. If uric acid and its equivalents are avoided, rather too much albumin will do no great harm, but too little is certainly dangerous; and amongst many miscomprehensions I have perhaps most reason to object to that which associates the uric-acid-free diet with a low proteid standard. The rules I give are clear, and persons who underfeed in spite of them have only themselves to thank for the consequences.

"Imperfect metabolism" (that refuge of the hard-pressed theoriser) makes its inevitable appearance in these articles as cause instead of consequence. One expects it patiently, yet it is really time it should be relegated to the rubbish heap of discarded hypotheses, for it is now quite easy to demonstrate it as a consequence in such cases as those under discussion. The man who lives on a right allowance of purin-free foods does not suffer from imperfect metabolism, because he has good blood in free circulation. Give him (with solvents) pure uric acid in stated proportion, and as the circulation slows metabolism deteriorates.

Again, the cause is referred to the nerve centre Jupiter, to the lack of nerve energy, neurosis, and other far-fetched ills. But who thinks of noticing whether the capillary circulation is slow, the blood pressure high, and consequently the circulation in the nerve centres and elsewhere defective? Still less is the underlying cause of these manifestations considered—the marked excess of uric acid in blood and urine.

In one of these articles the statement is made that a sufferer from depression and gouty trouble was cured for a time by eating a "good dinner,"—"good," of course, referring to meat,—with probably a glass or two of wine. And it is evidently felt that a point is thus scored against the uric-acid-free diet and those who support its utility. No records were seemingly made of the conditions present in the circulation, no blood was drawn, no urine was examined. The writer endeavours to explain empirically a series of facts imperfectly observed, and conclusive only to those who are satisfied with such observation. If, before the meal, the blood had been examined, it would have been found more or less charged with uric acid; if afterwards, nearly clear, and circulation, blood pressure, temperature, and urine would all have expressed the same relief,—to the surface observer a remarkable instance of "a hair of the dog that bit you,"—a case of uric acid trouble cured by a strong dose of the same substance or its equivalent.

We are confronted, however, by conditions not so immediately patent. What had taken place was this—Adding excess of uric acid to a blood already thus charged throws the whole out of solution, exactly as an added excess of lime to a lime-holding water acts as a precipitant and clears the vehicle. The blood being thus cleared, almost immediate relief supervened, but a relief satisfactory only in so far as the future is ignored.

The facts are easily verified, and if no instruments are at hand for testing the blood, the capillary reflux is sufficient clue. From such a mistaken premiss the venerable argument is set forth, that foods (*i.e.* meat) are harmful at one time and not at another, that one man's meat is another man's poison, and so forth; while the root of the whole matter is the relative solubility of uric acid. Uric acid kept in solution in the blood slows circulation and depresses metabolism. Uric acid driven out of solution, whether by food, acid drinks, cold, or other causes, leaves a clear blood and acts as a stimulant. These are the facts, simple indeed compared to the complication of explanation they have evoked.

I find in one of these articles the usual vague allusion to "the output of uric acid," but no definite statement as to whether this means an increased excretion, such as 10 grs. to-day and 15 or 20 to-morrow, or merely the precipitation of a little red sand in the water, which infers, as a rule, a slightly diminished excretion of uric acid. Such visible excretion, it is added, is sometimes found in conjunction with constipation. I have long since pointed out that constipation raises the acidity of the urine, and that this occasions the appearance of a little red sand. Its presence is no sign of excess of uric acid in the blood,—rather the reverse. Uric acid is never in excess in the blood without the signs of its presence in circulation, temperature, etc.; and the Spa waters which determine the appearance of red sand in the urine are generally clearing the blood by retention, and giving the patient relief from depression and suffering by so doing,—an instructive process which can be watched from day to day by an examination of the blood.

Let me state with the utmost precision that in no case is the uric acid controlled by metabolism, but that uric acid controls metabolism, and this can be demonstrated upon a subject free of uric acid excess as the result of correct dieting, and whose metabolism is therefore good. Administer uric acid and, I repeat, circulation will slow and general metabolism slacken. The only influence of metabolism upon uric acid is to cause its storage and retention, or conversely, its excretion in solution in the urine. Metabolism practically can neither destroy it, consume it, nor convert it chemically, and what has been accepted as a proof of such action was retention, followed later by an exactly correlated excretion. Every grain of uric acid ingested must be accounted for. If there were exceptions to this rule, some meat and tea takers would present the remarkable physiology of those who live on the uric-acid-free diet. But such cases have yet to be found.

It follows from these facts, and from the national habits, that mental and bodily feebleness increase. Less desire for work, an avid search for amusement, the need for frequent holidays, and the disturbance of nervous equipoise, mark this degenerative process, nor can it be necessary to labour these points to the readers I am addressing, and with whom they are a matter of hourly observation. Such changes of racial character are not surface movements, they have a deep pathological significance, and are concomitant with a steadily growing consumption of meat, tea, and other foods unsuited to the human organisation, the mischief of which is intensified by the necessary addition of innumerable drugs and stimulants taken to counteract their secondary depressant consequences. This is no longer hypothesis; it is a thing to be seen and tested. These poisons are visible in the blood, and their effects can be increased or diminished by a stated procedure. When their use is discontinued, under proper conditions the blood gradually clears, and, with this clearance, mental and bodily depression are dispelled, and the multitudinous effects of mistaken living are more fully realised in their absence. Resume the poisons (for they can be called nothing less) and the symptoms are immediately reproduced.

Patients beginning this diet have still, however, to deal with accumulations, and these will cause depression as they are swept through the blood. The natural tendency is to remove this depression by resuming the foods which give immediate relief. A parallel case is the misery of the opium-eater until another dose is administered, and in both the condition of the blood explains all. It is charged with uric acid during the depression; it is more or less cleared by the fresh dose, which sets up retention, and prepares the way for future depression and increasing dependence on the stimulant.

For want of comprehension of the law of solubility of uric acid and neglect in examining the blood, some would discard the uric-acid theory of gout. For me it has long since passed from the realm of hypothesis into that of working fact. Uric acid is the cause of gout because of its poor solubility, whilst urea and other products of metabolism are innocent of effect because their solubility is relatively complete, and because, also unlike uric acid, their precipitates are not colloids of large bulk.

It is mentioned as an interesting observation, that gravel and gout are not simultaneous. Examination of the blood discloses the reason. For the formation of a tophus in the toe co-ordinates the steady, progressive clearance of the blood and diminishing excretion in the urine, while in the opposite case of gravel the solvent power of the blood is high; there is consequently no retention, and an excess of uric acid in the blood and urine results.

Again, in leucocythæmia it is a puzzle to some why there should be no gout with a plus excretion of uric acid. Yet the answer is simple. Plus excretion is associated with an alkaline blood of good solvent power; gout is associated with diminished or diminishing solvent power and retention. Examine the blood and circulation, and they will furnish both diagnosis and prognosis.

It is true that people on a constant diet excrete varying amounts of uric acid, but this must be expected, for excretion varies with the solvent capability of the blood, and this again varies with clothing, climate, exercise, and several other circumstances. This will be so not in isolated cases but universally, and not occasionally but throughout life. So that one man at 50 will have only accumulated 300 grs. of uric acid, whilst another man has pounds, and yet their diet may have been almost identical.

For the answer to this difficulty watch the fluctuating quantities in blood and urine, and it will be found that it does not justify the conclusion that uric acid is not the cause of gout, but very much the reverse, since it provides a means of control which can be demonstrated daily and hourly.

Some have also administered uric acid to men and to animals, and have found it inert. Years ago I did this myself, and with a like result. Again, examine the blood and circulation and the answer is clear. It was not held in solution. It was locally retained, hence it produced only local irritation. Uric acid is a general poison only in circulation in the blood stream and in proportion to its amount. This can be seen and estimated.

With regard to tea, it is of interest that the nations which have used it longest take it weakest. We, who are novices, prefer it strong. Yet, however weak, stimulation must always be physiologically wrong, for to use reserves unnecessarily is to diminish disease-resistance. Nature's intention in these reserves is obvious; we have grossly misused it. It is a characteristic of the uric-acid-free diet that stimulants are not needed, and there is no collapse save from want of albumin, the only food that has an essential relation to force-production. Urea rises, and power increases; it falls, and power diminishes. If absorption of albumin ceases, urea falls greatly and suddenly, and there is collapse. It is an interesting fact that tea and all such stimulating infusions contain xanthin, which is practically uric acid, and (in the same way) clears the blood, thus stimulating metabolism and calling out reserves or enabling them to be used. Hence the feats done by their aid in the more or less complete absence of food. Here, again, examination of the blood reveals process. Let it be remembered, also, that other substances besides xanthin produce the same effect and clear the blood of uric acid, *e.g.*, acids, urea, or acid resins, and as such things are often present in plant structures, their effect in the body may not be proportional only to the estimated quantity of xanthin.

Allowing all these considerations the fullest weight, it is still quite unnecessary to diminish the albumin allowance, and for those who consult me I have never countenanced this change. By excluding uric acid and xanthin, the daily turnover of uric acid can be reduced by one-half, whilst albumin and urea are kept as before, and on this rule a fine blood quality can be secured, whilst even those who slightly underfeed will attain better health than most takers of meat and tea. No one secures potentially and practically perfect health on a diet which administers uric acid and its equivalents in large quantities. Stimulation lasts for a time, and is inevitably followed by reaction and depression proportionate to the amount of these dangerous substances ingested.

If it is considered that it is only in the last fifty years that this dietary excess of meat and tea has been universal, it will be realised how ill-founded is the belief that the nation cannot exist on more wholesome foods, though without this excess the really poisonous effects of these substances might have been overlooked for a much longer time. If it were possible to set down the Irish and Scotch peasants of fifty years since in London, the sight would create astonishment and alarm, for, having lived perforce somewhat on the lines I have indicated, they were immune from evils to which use has half habituated us, and which increase with arithmetical precision. If the quality of food is rightly chosen, nature will in a generation or two adjust the quantity, but at present for the growing army of invalids and neurotics, existence by rule is almost a necessity, owing to a depraved physiology.

My plea is, then, for impartial examination of the conditions I have defined. The day for empiricism and hypothesis as applied to the diseases connected with excess of uric acid is over, and those who investigate will find I have made no overstatement of the surpassing interest and importance of the results to be attained. Therefore the preventible suffering endured by reason of ignorance and indifference amongst the profession and the public would be incredible, were it not a fact to be reckoned with that fresh knowledge almost invariably runs the gauntlet of apathy, miscomprehension, and prejudice, before it obtains the recognition which opens its use to mankind; and this special branch of it can claim and has had no exemption from so general a rule.

ON EPIGASTRIC HERNIA.

By Alexander Miles, M.D., F.R.C.S.Ed., *Assistant-Surgeon, Royal Infirmary, Edinburgh; Surgeon to Leith Hospital.*

The term "epigastric hernia" is applied to that form of hernia through the linea alba which occurs between the ziphisternum and the umbilicus. Hernia through the linea alba has long been recognised, having been first described by Garengeot in 1743. Richter of Göttingen gave a detailed description of its various forms forty years later, and it also attracted the attention of Astley Cooper. More recently, Macready, Sultau, Woakes, Greene-Cumston, and others have added to our knowledge of the condition.

The anatomical structure and disposition of the linea alba and of the subjacent extra-peritoneal fat favour the development of this form of hernia. The linea alba is formed by the fusion of the aponeurosis of the flat muscles of the abdominal wall, and, in the middle line, the interlacing fibres form a network, the meshes of which are disposed horizontally. In some cases this network is comparatively open and lax, and diamond- or lozenge-shaped spaces are left between the bands of fibrous tissue. These spaces are elongated transversely, and their lateral angles are more acute than their upper and lower ones. This condition is sometimes congenital, and has been attributed to some interference with the development of the anterior abdominal wall. In other cases the spaces seem to be produced by repeated stretching or straining of the abdominal wall, such as is involved in hard manual labour. Above the navel, the linea alba is both broader and thinner than it is below.

The extra-peritoneal fat plays an important part in the development of epigastric hernia. In some subjects the fat is very sparse in this region, so that the peritoneum is closely apposed to the linea alba; in others there is a fairly thick layer of fat arranged in club-shaped lobules loosely attached to one another by strands of connective tissue. Operative experience, in opening the abdomen near the middle line, shows that, in some subjects, the two layers of the falciform ligament of the linea are separated by a considerable interval, the space between the two layers being filled with extra-peritoneal fat.

It would appear that the anatomical condition which favours the development of epigastric hernia is the combination of a thin, open, and lax condition of the linea alba with the presence of a loose layer of coarse extra-peritoneal fat.

When these conditions are associated, a process of extra-peritoneal fat may be protruded through one of the interspaces, which gradually become stretched until it attains considerable size. It may retain its diamond shape, or may become oval or rounded. The individual lobules of fat are pressed together and become fused by connective tissue, which becomes condensed towards the periphery of the mass, and so encapsules it. In this way the protrusion acquires the characters of a fatty tumour, and is sometimes spoken of as a "sub-peritoneal lipoma." As the plug of fat is pushed out, it drags behind it a funnel-shaped process of peritoneum, which may ultimately constitute the sac of a hernia. In one of my cases (Case 4), in which an epigastric hernia had been acquired, the sub-peritoneal lipoma was directly attached to the process of peritoneum which formed the sac; in another (Case 3), in which the condition was congenital, it was attached through the medium of a long fibrous band. In two cases (5 and 6) in which I have operated for strangulation there was no lipoma to be detected, and it is possible that when the hernia has lasted for a considerable time the pressure may cause the fat to atrophy and disappear.

It would appear that, in some cases, the lipoma is protruded without pulling the peritoneum behind it, and that it presents on the anterior abdominal wall as an ordinary lipoma. This, however, is not common, and its occasional occurrence seems to have led to some confusion of ideas regarding the clinical aspects of epigastric hernia. There does not appear to be any advantage in attempting to differentiate clinically between the so-called sub-peritoneal lipoma pure and simple and that which is related to an epigastric hernia. The two conditions give rise to the same clinical phenomena, and it is more rational to look upon them as different stages in the same process rather than as separate clinical entities. In one of my cases, all that could be made out by manipulation was a small lobulated swelling just under the skin, yet on exposing this by incision it was found to be attached to a hernial sac which contained a tag of adherent omentum.

It has been suggested that the sac is sometimes formed by a sudden muscular effort on the part of the patient, such, for example, as lifting a heavy weight, or bending the body forcibly backward. The appearances seen in the few cases in which I have operated make me doubt if this is at all likely. It is more probable that the sac is gradually formed, and that a sudden increase in the intra-abdominal tension merely forces something into it, and so draws attention to its existence.

As a rule there is only one hernia, but cases have been recorded by Woakes and others in which there were more than one.

The contents of the hernia in the majority of cases consist merely of a process of the great omentum, which may or may not be adherent to the inner wall of the sac. In some cases the omentum carries with it a portion of the transverse colon. In others, a loop of small intestine is herniated, and from the position of the sac this is usually a portion of the jejunum pretty high up. In both the cases in which I have operated for strangulation, a loop of the upper part of the jejunum was involved. At one time it was generally supposed that the stomach was the viscus most frequently protruded in this form of hernia. Garengeot believed, indeed, in view of the prominence of gastric symptoms, that it was present in all cases. Apart from the cases reported by Nélaton, Thoman, and one or two others, however, there are few authentic records of herniation of the stomach in epigastric hernia. Scarpa recorded a case in which a hernia of this variety included the ligamentum teres of the liver, and I am able to add another. In my case the ligamentum teres was firmly attached to the neck of the sac, and the symptoms from which the patient suffered were apparently attributable to the traction which was thus made upon the liver (Case 4).

As regards the *frequency* of epigastric hernia, Berger's statistics show that it is comparatively rare. In 10,000 cases of hernia of all kinds, only 137 were of the epigastric variety. Of these, 129 occurred in patients over 15 years of age, and eight in younger subjects. Statistics vary with regard to the *sex incidence* of the affection, although there is no doubt that males suffer oftener than females. Berger, for example, estimates that seven males suffer for one female; Macready puts the proportion as four males to one female. All my six cases occurred in males.

The condition is met with most frequently in patients in the prime of life, and in those who follow some occupation involving hard manual labour. In my adult patients the age at which the condition was first observed, so far as I could ascertain, was 30, 32, 52, 64. As is seen from Berger's figures, it is rare during childhood. I have performed the radical cure in a boy, æt. 12, who had had the condition since birth.

Clinical features.—In a considerable number of cases—according to Macready, in the majority—the patient suffers in no way from the hernia. The signs are entirely local, and simulate very closely those of an ordinary fatty tumour. The swelling, however, is peculiar in that it can be diminished in size, or even made to disappear, by making pressure over it. It may exhibit a distinct impulse on coughing, and on pulling upon it pain may be caused. In other cases the hernia is irreducible.

Case 1.—A labouring man, æt. 64, noticed a swelling in his abdominal wall ten or twelve years before I saw him. It was at first about the size of a hazel-nut, and could be made to disappear by pressing on it, but it gradually became larger, till it reached the size of a Tangerine orange. It was situated a little above the umbilicus, and slightly to the right of the middle line. The skin was freely movable over it, and it was distinctly lobulated like a fatty tumour. It could be diminished by manipulation, but could not be made to disappear completely. As it had never caused him any pain, and was not associated with any gastro-intestinal symptoms, he declined to have anything done for it.

In most cases the patient complains of symptoms of dyspepsia—colicky pains in the region of the stomach, sometimes described as "cramp in the stomach," sickness, eructations, and sometimes diarrhœa. It was this train of symptoms which led to the belief, now shown to be erroneous, that the stomach was frequently involved in the hernia. Such symptoms may quite well be accounted for by the dragging exerted by the pad of extraperitoneal fat on the peritoneum. Lennander has shown that traction on the parietal peritoneum is excessively painful, and that the pain is usually referred to the gastric region, and this observation can readily be verified during any laparotomy performed under local anæsthesia.

Case 2.—A feeble old man came to the Out-patient Department of the Royal Infirmary in May 1900, complaining of pain in the region of the stomach and symptoms of dyspepsia. Midway between the ziphisternum and the umbilicus there was a rounded swelling, about half the size of a hen's egg, lobulated, and free of the skin. It could easily be reduced by manipulation, and appeared again when the patient coughed. It was diagnosed to be an epigastric hernia into which a portion of omentum was protruded. The patient was not in a fit condition to be operated upon. He received treatment for his dyspepsia, but has since been lost sight of.

These dyspeptic symptoms were even more marked in the case of a boy, æt. 12, where I was able to verify the diagnosis by operation. The sub-peritoneal lipoma was attached to the sac by a fibrous cord, and adherent to the inner wall of the sac was a finger-like tag of omentum.

CASE 3.—*Congenital epigastric hernia; attacks of pain and vomiting; radical cure; recovery.*—A smart, wiry boy, æt. 12, was sent to me in September 1904, by Dr. Allan Gray of Leith, on account of a small round swelling, about the size of a marble, situated a little above the umbilicus. It was clearly defined, just under the skin, and rolled about beneath the finger. On picking it up, however, it was found to have an attachment on its deeper aspect, and on making traction on it the patient winced. His mother stated that the swelling was first noticed when the boy was about a month old. It was then about the size of a pea, and her attention was drawn to it while bathing the child. It gave rise to no trouble till he was 7 years of age, when one night he was suddenly seized with acute pain in the abdomen, the pain being referred to the epigastric region. The pain subsided under local applications. Since then the patient had frequently had similar attacks of pain, lasting sometimes for a few days, and attended with bilious vomiting. He had been unable to take much exercise, as when he exerted himself at play he suffered from pain in the epigastrium which doubled him up.

A transverse incision was made over the swelling, which was found to lie just under the skin. On isolating it, it was found to be attached by means of a fibrous band to a small rounded hernial sac, which on being opened contained a finger-like process of omentum adherent to its inner wall. This was separated, the neck of the sac ligatured, and the opening in the linea alba closed by means of a Macewen suture. The wound healed by primary union. Since the operation the patient has been free of pain, but he still suffers occasionally from attacks of "biliousness."

In another case, in which I performed the radical operation, severe and prolonged attacks of pain and vomiting were prominent features, and were apparently to be explained by traction exerted on the liver through the ligamentum teres, which was attached to the neck of the sack.

CASE 4.—*Acquired epigastric hernia; attacks of pain and vomiting; ligamentum teres of liver adherent to sac; radical cure; recovery.*—A strong, healthy man, æt. 33, who was employed in agricultural work, was sent to me by Dr. Martine of Haddington, in November of 1904, on account of a swelling in his epigastrium. His story was that for a long time he had been subject to attacks of pain in the pit of the stomach, which he attributed to indigestion. About five months before I saw him he had a very severe attack, which was attended with vomiting, and which lasted for four days. Shortly after it had subsided he noticed for the first time a swelling in the epigastrium, which was soft and nodular. It never disappeared spontaneously; but he noticed that when he lay on his back it became smaller, and that by pressing upon it he could make it disappear. Four months later he had a similar attack, which lasted for six days, the vomiting being more persistent, and on this occasion he vomited blood. The bowels moved regularly during these attacks. His doctor told him that these attacks were due to the lump, and advised him to have it operated upon.

When patient was admitted to Leith Hospital, he presented in the middle line of the abdomen, and an inch and a half below the tip of the ziphisternum, a rounded swelling, about the size of a bantam's egg. It was slightly lobulated, was not attached to the skin, and it transmitted an impulse on coughing.

A transverse incision, made over the most prominent part of the swelling, exposed an encapsulated lobule of extra-peritoneal fat, closely resembling an ordinary lipoma. On making traction on this, a finger-like process of peritoneum was pulled out through an oval opening in the linea alba, which admitted the tip of the little finger. The margins of the opening were well defined and fairly rigid. On opening the sac and passing a finger into the peritoneal cavity, a rounded cord was found firmly attached to the lower margin of the sac as it entered the ring. This cord proved to be the ligamentum teres of the liver, and on making traction on it the margin of the liver could be pulled down to the level of the sac. To enable the neck of the sack to be occluded, it was necessary to divide and ligature the ligamentum teres. The sac was then folded up and placed as a buttress on the inner aspect of the ring, and the ring was closed by means of a stay-lace suture. The skin wound was sutured without drainage. To relieve the upper part of the abdominal wall from pressure the head of the bed was raised on blocks. The wound healed by primary union, and the patient returned to his work in about a month.

Strangulation does not appear to be a very common complication of epigastric hernia. It may supervene suddenly in cases in which the hernia has never given rise to any inconvenience, or it may be the culmination of a long period of suffering. The clinical manifestations of strangulation are similar to those of other forms of hernia; and when the prolapsed loop of bowel is high up in the jejunum, early and persistent vomiting is a prominent feature, the vomited matter soon containing bowel contents with a fæculent odour. The following two cases, on which I have had occasion to operate, are illustrative:—

Case 5.—*Epigastric hernia; strangulation; resection of loop of jejunum; recovery.*—The patient (John O.) was a dock labourer, æt. 42, who had always enjoyed good health. For ten or twelve years he had observed a swelling in the upper part of his abdomen a short distance above the navel, and his impression was that this was becoming larger; but as the condition caused him no inconvenience beyond an occasional slight pain, he paid no attention to it. Until within a month or two of his admission to hospital he had been a hard drinker, and he stated that since he had changed his habits in this respect he had suffered greatly from constipation.

While employed in the docks in the early morning of the 2nd February 1904, he was suddenly seized with pain in the upper part of the abdomen, so severe as to make him give up his work and go home. He went to bed and applied hot fomentations to the abdomen all day, but without obtaining relief. In the evening he was seen by Dr. Mabel Ross, who advised his immediate removal to hospital with a view to operation; but he refused to leave his home. During the night the pain became more severe, and he began to vomit, and in the morning he came to Leith Hospital asking to be admitted.

On admission, about twenty-six hours after the onset of his illness, the patient looked very ill. His pulse was small and weak, 96 per minute; his respiration 22; and his temperature 99° F. Just after being put to bed he vomited a considerable quantity of greenish-yellow matter with a fæcal odour. A swelling about the size of a goose's egg was found in the middle line of the abdomen, halfway between the ziphisternum and the umbilicus. It was smooth and tense, and did not yield an impulse on coughing. The skin over the swelling was dusky red. On examining the inguinal regions, it was found that the patient had a large hernia on the left side which reached to the bottom of the scrotum; but as this hernia was readily reduced it was evident that it was not the cause of his symptoms.

A transverse incision was made over the epigastric swelling, and as soon as the skin was divided the sac of the hernia was exposed. It was dark in colour, soft and friable, and on being opened gave exit to a quantity of brownish fluid. In the sac was found a coil of small intestine, about 5 in. long, black, soft, and lustreless, and firmly constricted by the edges of a slit-like aperture in the linea alba. The ring having been divided, the bowel was pulled out and was found to be a portion of the jejunum near its upper end. A portion of bowel, 7 in. long, including the gangrenous segment, was resected, and end-to-end suture performed. The sac was then removed, and the peritoneal cavity closed without drainage. The external wound was packed and left to granulate.

For some hours after the operation the patient continued to vomit bile and bowel contents, but this ceased after the stomach had been washed out. The bowels moved on the third day, after a turpentine enema, and in three weeks he left the hospital well.

Case 6. — *Epigastric hernia; strangulation; operation on third day; fatal.*—On 19th May 1900, an old man, John M., æt. 67, was admitted to hospital suffering from symptoms of intestinal obstruction. He was too ill to give a complete history of his condition, but it was learned that for years he had noticed a swelling in the epigastrium, which disappeared when he lay down, but bulged out again when he got up or made any straining effort. It never gave him any trouble till three days before admission, when it suddenly became larger than hitherto, and could not be returned by pressure. There was great pain in the swelling, and soon after it came down he began to vomit, and the vomiting had been persistent ever since. What he brought up was at first yellow, later dark-brown, but it had no fæculent odour. The pain radiated all over the abdomen and through to the back. The pulse was only 44, and so feeble that it could scarcely be detected at the wrist; the respiration was shallow and rapid, 48 per minute; and the temperature was 97°·8 F. The skin was dusky and cold.

Midway between the ziphisternum and the umbilicus was an elongated oval swelling, lying in the transverse axis of the abdomen. It was irregularly lobulated, with a deep medium salcus which divided it into two symmetrical halves. It was tense and tender to the touch, and was irreducible. Although the patient was obviously moribund, it was deemed advisable to operate.

A transverse incision made through the skin over the swelling, exposed a fairly thick sac, which contained some blackish fluid. The sac was bilocular, each compartment containing a portion of omentum about the size of a small orange slightly adherent to its wall. In one loculus, a loop of jejunum, about 5 or 6 in. in length, was found, deeply congested but still glossy. At one point this was attached to the prolapsed omentum by recent adhesions, which were easily separated. The bowel was returned to the abdomen; the omentum clamped and removed; the sac isolated, puckered up, and fixed inside as a pad; and the margins of the ring, which measured $1\frac{1}{2}$ in. × 1 in., made to overlap one another by means of a Macewen stitch. The external wound was closed without drainage.

The general condition of the patient improved to some extent, but although he passed flatus and the bowels moved well several times, he died twenty-two hours after the operation. There was no post-mortem examination.

Treatment.—It has been found that trusses and belts are seldom efficient in controlling these herniæ, and as there does not appear to be much tendency to spontaneous cure, the only treatment to be recommended is by operation. This should be advised even when the only external evidence of hernia is in the form of a sub-peritoneal lipoma, as this is usually an early stage in the development of a hernia; and if the condition is dealt with at this stage, the operation is simple, and as a rule satisfactory in its results. While it is admitted that strangulation is rare, it is to be borne in mind that, from the nature of the aperture in the abdominal wall, if it does occur it is likely to be acute, and as it is liable to involve the higher parts of the small intestine it is rapid in its progress, and quickly endangers the patient's life.

In performing the radical cure, a vertical or preferably, I think, a transverse incision is made over the swelling. The sub-peritoneal lipoma is isolated and traced down to the sac, to which it is usually adherent. The sac is then freed all round from the margins of the ring, pulled well out, and either ligatured or, if possible, puckered up by the method employed by Macewen in dealing with the sac in inguinal hernia, and fixed inside the abdomen by a catgut suture so as to form a buttress opposite the ring. The pillars of the ring are then brought together by means of a stay-lace suture, or are made to overlap one another by a Macewen stitch. According to the shape and arrangement of the ring, it may be closed vertically or transversely.

In operating for strangulation, a semilunar incision should be made through the skin so as to avoid passing over the most salient part of the swelling, as the bowel may be very near the surface and is liable to be injured. The ring is enlarged, the sac opened, and the contents pulled out and examined. As in other forms of strangulated hernia, if the bowel regains its normal colour after having been relieved for a few minutes, if a peristaltic wave can be sent along it by flicking it with the finger, and if the peritoneal surface still retains its gloss, it may be returned; otherwise it is safer to resect the devitalised loop and perform end-to-end suture.

HEREDITY AND AFFILIATION.

By Stanley B. Atkinson, M.A., M.B., B.Sc., *of the Inner Temple Barrister-at-Law.*

An early historian records the fact that Father Adam "begat a son in his own likeness, after his image." Since then dramatists and novelists have applied frequently and with telling effect the fundamental biological principle enunciated in that statement. Notably did Shakespeare hold as 'twere this mirror up to Nature in *The Winter's Tale* (Paulina, Act ii. Scene 3, and Leontes, Act v. Scene 1), in *King Henry IV.*, Part I. (Falstaff, Act ii. Scene 4), and *King John* (Act i. Scene 1).

How far may these personal resemblances between individuals be admitted as positive evidence of their blood relationship? In a court of law the question is asked usually in reference to disputed paternity. It would also be a pertinent inquiry in the elucidation of such problems as perplexed both Electra, when furnished with incredible news of her long-lost brother, brought fresh from Agamemnon's tomb, and also the judicial Solomon when confronted with the clamant mothers. It may be suggested that in this latter instance the real motive was rather to disclaim the overlain illegitimate babe than to claim the living infant, for it was a shameful thing for a Hebrew to be so forgetful of her maternal duties as to overlay her offspring. It is significant that we are told of the Madonna placing her Child in a manger, which apparently was the best available cradle.

What is the value of physical or mental likeness in deciding cases of affiliation, using that term in its wider sense? The negative absence of such characters goes for nothing. If the alleged resemblances are slight, they may be merely fanciful or coincidental. But if a positive presence of similarities is marked, they may be regarded as affording a probable, practical, and *primâ facie* test of paternity, increasingly so if they are continued and accentuated as the life of the child expands. In all cases, however, great care must be taken not to be misled by sporadic examples of recessive ancestrianism, or by the effects of an abnormal intra-uterine environment.

The scope of medical jurisprudence is to review the science, the art, and the forensic value of such medical testimony as is pertinent in a court of law. Thus, in this present matter it is concerned with a practical application of a principle of biology, namely, the canon of heredity. The final word has not been said upon this subject by Darwin, by Mendel, by Weissman, nor by Archdall Reid. Hence there can be no ground for surprise that the question of scientific fact which arises in this connection is not left solely by the Court for a jury to consider and determine; the facts adduced are compromised by certain presumptions of law which, if at times seemingly not wise, are at least expedient, for it is admittedly a commendable public policy to assume, until the reverse has been established, that righteousness has been fulfilled.

The lawyer says: *Pater est quem justæ nuptiæ demonstrant.* It is a legal presumption that, apart from divorce proceedings, a child is to be regarded as conceived legitimately when it is born to a wife whose husband, during the period necessary for the inception of normal gestation, has been capable of "generative access," and has not suffered "inability from a bad habit of body," that is, is not sexually impotent. The ability of access is a matter for the justices to decide. Non-access being proved, resemblances might be of *primâ facie* value in determining paternity. With illegitimate children, although a bastard may be fixed by law for its maintenance and education upon a putative father, the latter does not thereby become its parent, for he is still in law "a stranger in blood," the mother standing *in loco parentis* to the "nobody's child."

It is notorious that lawful children occasionally are born bearing a striking similarity, in physical conformation or in colour of hair, to a friend, other than the husband, of the mother. Most of these alleged likenesses are exaggerated coincidences. Some have been explained by one parent having a private or cured deformity or a clandestine habit of dyeing the hair. Others, as with Mrs. Judge Jenkins' twins, are among the "sad" things which "didn't ought to have been." Seldom do these instances gain the publicity of a court of law, for the parties concerned agree that the game would not be worth the scandal; further, the theory of the alleged influence of "maternal impressions" is still as unsettled as when Persina, the Ethiop queen, after gazing at a picture of Perseus and Andromeda, begat "a faire white child," and as when Jacob so practically applied the test at Laban's expense.

There are both biological and jurisprudential objections to the admission of arguments based upon the presence in a child's body of signs which are the alleged consequences of "maternal impressions." It matters not whether the mind or the body of the mother was impressed, in the former case as by a fright or a longing, in the latter case as by an injury or a process of telegony.[1] There are a few recorded examples where a child is said to have resembled the deceased or long-absent husband, or his very present brother![1] Biologically considered, the vital play of the complex ancestrian forces of heredity is finally fixed at the time of conception. When the ovum has been fertilised, the plan of the potential man is as clearly plotted as would be the case if the *homunculus* theory of generation satirised in "Tristram Shandy" (1759) was correct. Apart from heredity, congenital characters may be acquired by the fœtus *in utero* by forces which may be properly denominated environmental; similarly, variations in the income and the habits of life of the husband will influence the pregnant wife's environment. All congenital appearances are not the result of heredity; but an abnormal effect upon the fœtus alleged by the mother to be due to an external accident or an internal yearning (as in the case mentioned by Chaucer in "The Marchand's Tale"), must be examined very critically. The lay interpretation usually can be rejected as a mere coincidence magnified into a popular fallacy. The unscientific mind preferably credits the sensational and wonderful, even if the "explanation" patently is based upon a *stat pro ratione voluntas* argument. An instance of this was recorded by the writer in 1901.[2] Erasmus Darwin was told by William Hunter that in a long obstetrical experience he had never known a fulfilment of a parturient mother's prophecy as to an anticipated abnormality in her child; though frequently an actual deformity in a newly-born child had served to recall or to accommodate a remarkable prenatal occurrence. Bishop John Jewell, in a letter written in 1562 to Bullinger of Zurich, speaking of the continued inclemency of the weather, says: "As a result of this plague, infant prodigies are born, some without heads, others with the heads of monsters, others without limbs, others mere living skeletons." Great caution is necessary in listening to a woman who desires to affiliate her child to a desirable but possibly innocent man, who happens to be both at hand and formed or deformed similarly to her child. Some other person in the wide world is almost certain to resemble more or less closely or to "double" any given individual.

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[1] "The Penicuik Experiments" (Part II.), Ewart, 1899.

Forensically, the reception of medical testimony as to events in an antenatal biography would admit matters far too conjectural and coincidental to be trustworthy, and often would necessitate a very full discussion by "eminent medical experts" of the rival theories and the disputed facts concerning "impressions" and the hidden workings of heredity.

There is a curious extension to which actions at law upon alleged antenatal injuries might lead if once allowed. A child might sue its own parents for a congenital pathological condition which probably was due to the previous iniquity or carelessness of the father or mother, or of both. As a result, the child might allege that it was prevented from starting its life in this world with a sane mind and a sound body.[1]

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[1] "De l'Imprégnation de la Mère" (cap. v.), Cousin, Paris, 1903.

[2] *St. Barth. Hosp. Journ.*, London, August, p. 169.

Physical resemblances may be alleged in proof of kinship: to substantiate a peerage succession claim, to legitimate a doubtful heir, or to affiliate a child born out of wedlock. The facts of the last are settled not by a jury, but at petty or quarter sessions, and the question is usually one for the poor-law; it is notable that a bastardy order may be issued provisionally before the birth of the child. The solution of several subsidiary problems may be aided by a consideration of these matters: parental sterility may be probed, the parentage of a supposititious child may be revealed, the possibilities of alternative paternity (as with *jus primæ noctis* and Deut. xxv. *vv.* 4–7) or superfecundation (as with a black and a white twin), may be exemplified. An argument may be obtained to indicate the defendant in an action for seduction (that is, "loss of services" during pregnancy and beyond), or to fix the offender in a charge under an amended Criminal Law Amendment Act.

In bastardy proceedings, since 1835, "if the evidence of the mother be corroborated in some material particular," she is likely to be successful in "swearing her child" to a putative father. Personal likeness might be thought to be confirmatory testimony of the mother's allegation, for it has long been settled that "the material particular" need not be fortified by another direct witness. Common experience, however, proves that many of the details of resemblance between parent and newly-born child exist only in the eyes of the former, they are not patently evinced until the child has passed the anniversary which nullifies the mother's right of action against the alleged father. Where the resemblance is marked, owing to a definite rare deformity or to an ethnological peculiarity, this form of *primâ facie* testimony may have to be weighed and interpreted by the Court. Instances of actual deformities are the prominent mandible of the Hapsburgs, and hereditary polydactyly and syndactyly, upon which, in 1903, an affiliation case was based in Jamaica. An occasional event, in England usually at a seaport town, is for a negro lodger to be succeeded in due time by a mulatto baby. In 1731 it was held at petty sessions that such a child could not be the offspring of a putative English father. In 1849 (Piers *v.* Piers), however, Lord Campbell interjected *obiter*: "So strong is the legal presumption of legitimacy, that, in the case of a white woman having a mulatto child, although the husband is also white and the supposed paramour black, the child is to be presumed legitimate, if there is any opportunity for intercourse." This statement savours somewhat of the principle of possible unearned increment adopted in the *Year Book* of 1406: "Who that bulleth my cow, the calf is mine." Where negroes abound, this mulatto test has numerous applications (Whiterlos's case). In the case of twins, separate affiliation orders are advised; if they are not true twins, they may afford an opportunity of demonstrating in a court of law a rare case of superfecundation.

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[1] Cf. Courtney Kenny, "Torts," p. 59 and p. 105.

There are a few reported cases where evidence as to personal resemblances between the living and the dead has been allowed in High Court proceedings.

In *The Douglas Peerage Case* (1767), Lord Mansfield delivered a comprehensive opinion: "I have always considered likeness as an argument of a child's being the son of a parent, and the rather as the distinction is more discernible in the human species than other animals; a man may survey ten thousand people before he sees two faces perfectly alike; and in an army of one hundred thousand men every one may be known from another. If there should be a likeness of feature there may be discriminancy of voice, a difference in the gesture, the smile, and various other characters; whereas a family likeness runs generally through all these; for in everything there is a resemblance, as of features, size, attitude, and action." Thus early was the fact recognised, that the expression of the activities of the central nervous system is governed by hereditary influences: to-day we may lay stress upon the temperament, the conformation of the ear, finger-prints, handwriting, and an examination of the outlines of the bony structures with the aid of the X-rays. To these items for comparison hereditary deformity and transmitted disease should be added.

In Day *v.* Day (1784), Mr. Justice Heath said: "I do admit these resemblances are frequently fanciful, and therefore you should be well convinced it does exist; but if you are convinced it does exist, it is impossible to have stronger evidence."

In Morris *v.* Davies (1837), a witness deponed that a child (born five years after a husband and wife had voluntarily separated) and the alleged father (to wit, the husband) were, "As like as two candles." The Court made no subsequent reference to this matter.

In *The Townshend Peerage Case* (1843), testimony of alleged resemblances was given by a schoolmaster.

In Bagot *v.* Bagot (1878), the question arose where a testator was alleged to have had a delusion that his son was not his issue, and thereupon disinherited him. The case was taken to Appeal, but this evidence of fact was not further considered.

A consideration of these forensic contests convinces one that both proverbs are occasionally true: "'Tis a wise father that knows his own child." "'Tis a wise child that knows his own father."

LEUKANÆMIA.

By F. G. BUSHNELL, M.D. (Lond.), D.P.H., *Pathologist, Stephen Ralli Memorial Laboratory;* and DONALD G. HALL, M.A., M.D. (Cantab.), M.R.C.P. (Lond.), *Assistant-Physician, Sussex County Hospital, Brighton.*

CASE.—F. H., æt. 25, was admitted to the Sussex County Hospital on 28th April 1905.

History.—His father died of phthisis. His mother was alive and healthy, had had four other children, all alive and in good health; she had had no miscarriages. Patient was a full-term child, third in the family, and of average size at birth. Labour was normal. When three days old he became a dark jaundiced colour, and was not expected to live. He, however, survived the attack, and was brought up on the breast. Throughout his life he had had frequent attacks of pain in the upper abdomen, associated with some abdominal distension. During these attacks the motions were "always pale-grey, and like a baby's motion." The urine at these times was very dark. When 8 or 9 years old he had "dropsy," and he also used to get "rheumatics" at times, but there was no definite history of scarlet, rheumatic, or other acute fever. He had had many epistaxes, no other hæmorrhages, and been subject to sores on the ankles. The abdominal lump was first noticed about ten years ago, has increased steadily since, but not rapidly. The epistaxes were of still earlier onset. No examination of the blood had been made.

On admission, patient was very poorly developed and nourished. Looks like a boy of 16. Mouth partly open, showing the upper incisors. No stigmata of congenital syphilis. There was no hair on the face, other than down, and he had never had occasion to shave. Colour was pale-lemon, the conjunctivæ not jaundiced. There was no clubbing of the fingers, or other physical deformity. Weight, 4 st. 8 lb. Height, 5 ft.

The abdomen was distended; circumference, 25 in. at umbilicus; 26½ in. at lower costal margins. No free fluid.

Spleen greatly enlarged, filling most of left side of abdomen, reaching to midway between the umbilicus and a line drawn between the anterior superior iliac spines. The anterior edge just fell short of the middle line, the notch was felt ½ in. above the umbilicus. Above, the splenic dulness began at the eighth rib in the mid-axillary line.

Liver dulness began above at fifth rib in right nipple line, the lower border reached three finger-breadths below the inferior costal margins. Both splenic and hepatic enlargements were firm and painless. No abnormality was noted in other abdominal organs.

Thorax.—*Lungs* were apparently healthy. *Heart* was enlarged. Apex beat in sixth space ¼ in. external to left vertical nipple line. There was a systolic murmur at the apex replacing the first sound, and conducted into the axilla. A systolic bruit was also present at the base, and in the neck.

Pulse, 96, regular in force and rhythm, of poor volume and low tension; vessel wall healthy.

Urine rather light in colour, acid; sp gr. 1018; no deposit, bile, blood, sugar, albumin, or pathological urobilin.

The horizontal set of inguinal glands was slightly enlarged. No other enlarged glands, deep or superficial, were made out. The thyroid was of normal size. No abnormality of the osseous system was present. The pubic hair was entirely absent; testicles descended, size of hazel-nut. Patient was quite undeveloped sexually; intellect good; cleanly in his habits; patient takes a pride in his personal appearance, and is always neat and tidy.

Blood Examinations.—Examination of 6th May by Thoma Zeiss instruments gave erythrocytes 1,120,000 per c.mm., and leucocytes 11,000 per c.mm., Bushnell's blood commixer being used to rotate the hæmocytometers. Haldane's modification of Gowers' hæmoglobinometer gave 15 per cent. of hæmoglobin, with a colour index of 0·7 and 1 white to about 100 red.

For a differential count of 578 leucocytes, the proportions were as follows:—

Polynuclears (per cent.), 60·8; myelocytes, 8·6; eosinophil polynuclear, 1·2; intermediate cells, 4·6; lymphocytes, 23·1; large lymphocytes, 0·5; basophil cell, 0·5.

The "intermediate" cells were cells with indented nuclei and granular cytoplasm or rounded pale staining nuclei and narrow rim of acidophil cytoplasm or with characteristics between large lymphocytes and polynuclears.

There were seven normoblasts and one megaloblast seen in this count. There was decided polychromasia and poikilocytosis. Some of the erythrocytes contain punctate basophil bodies. If intermediate cells be added to myelocytes a total of 13·2 per cent. is reached.

March 17.—The leucocytes were 6400 per c.mm.

June 3.—The erythrocytes were 1,280,000 per c.mm., and the leucocytes 2400 per c.mm.; the colour index was 1·0; and the hæmoglobin 25 per cent., with 1 white cell to 533 red cells.

Polynuclears (per cent.), 64·8; eosinophil polynuclears, 3·1; myelocytes, 1·8; intermediates, 1·8; lymphocytes, 28·3; basophil cells, 0·6.

A normoblast and polychromasic megaloblast are seen.

June 10.—The erythrocytes were 1,736,000 per c.mm.; the leucocytes, 3800 per c.mm.; the hæmoglobin was 20 per cent.; the index was 0·58.

Films show normoblast, small myelocytes, megalocytes, and polychromasia.

June 26.—The erythrocytes were 1,840,000 per c.mm.; the leucocytes were 2200 per c.mm.; the hæmoglobin was 22 per cent.; the index was 0·6.

Small numbers of myelocytes were present.

Further Notes.—The provisional diagnosis was made of splenomyelogenous leukæmia, complicated with pancreatic infantilism. For some time he was treated with pancreatic extract, but at no time during his stay in hospital did the stools show sign of pancreatic inadequacy, and both the salol and iodoform tests were positive.

From 11th May onward he took arsenic in increasing doses without any apparent benefit. X-rays were not tried. For the first six weeks the temperature varied from 100°·4 to 97°·8, being usually 99°–99°·4. Afterwards, for the remaining four weeks, it did not rise above 99°.

During his stay in hospital he gained 8 lb. in weight, but did not increase in height, and he was discharged with apparently some improvement in his general condition, although there was no change in the spleen and liver, and no improvement in the blood. There were no hæmorrhages during his stay in hospital. He died suddenly at home on 6th August 1905, and, owing to the kindness of Dr. F. Robson of Haywards Heath, we were enabled to perform a post-mortem examination there on 8th August.

Post-mortem Examination.—The autopsy was made on 8th August 1905, in hot weather, forty-eight hours after death. Rigor mortis is present, and there are marked signs of decomposition. The body is thin and ill-developed, the testes the size of common playing marbles, the pubic eminence hairless, the skin and conjunctivæ are of a yellow colour, the subcutaneous fat is small in amount and yellow; there is no fluid in abdominal cavity. No relic of thymus gland traced. The thyroid gland is not enlarged. The lung shows no recent tubercle, but a small calcareous nodule is present in the substance; the weight of the left lung is 2 lb. ¾ oz. The heart muscle is of a pale brown colour; there is no clots in the cavities; the mitral valve admits three fingers. The pericardium contains excess of brownish fluid. The pulmonary artery contains a red gelatinous clot, and the aorta a red and white gelatinous clot. The stomach contains a large amount of undigested vegetable matter, *e.g.*, the skins of beans, etc., but there is no ulceration, etc. The liver is uniformly enlarged, and weighs 3 lb. 11 oz. (59 oz.). (In Parkes Weber's case, 88 oz.) It shows post-mortem staining. The ducts are dilated and bile stained. No gross changes are seen in parenchyma. The gall bladder is shrunken, its walls are thickened, it contains branching white gall stones, a probe passes easily from it into the common bile duct; about 1 drachm of creamy pus was found near to it. The pancreas weighs 8 oz.—nothing noteworthy. The spleen is uniformly enlarged; it weighs 2 lb. 10 oz. (42 oz.). On section it is red and rather firm. No infarcts are present. (In Weber's case weight of spleen was 66 oz.) The kidneys show post-mortem green colour, the left weighs 5½ oz. The suprarenal capsules show nothing noteworthy. The testes and prostate are small. The lymph glands are of a reddish colour, but not enlarged. The hæmolymph glands are not enlarged. The marrow of ribs, sternum, humerus, radius, and ulna is of a red colour, increased in amount, and not very firm. All the epiphyses are united. No hæmorrhages are present. No evidences of syphilis are seen. Brain and cord not examined.

Microscopical Examination.—About 150 sections were examined. The tissues were fixed in Orth's solution, Müller's fluid and Hemming. They were stained by hæmatoxylin and eosin, by Mann's lung eosin and methyl-blue method. Jenner's stain as modified by Scott (8) gave by far the best results in distinguishing blood elements in tissues. Unfortunately, owing to the unavoidable delay in obtaining the tissues after death, fixation was imperfect.

The marrow shows in all bones and in their centres a very cellular character, with many capillaries and an absence of fat vesicles. Neutrophil myelocytes, many of small type, and mononuclear cells are most numerous. There are numerous giant cells, with round pale staining nuclei, containing vacuolated areas, and the remains of cells from two or three to fifteen or twenty. Also giant cells with twisted nuclei. There are a few eosinophils and many polynuclears, lymphocytes, and erythrocytes. There is an excess of normoblasts, but it is difficult to draw a sharp line between these cells and lymphocytes, mitoses are infrequent.

B. coli communis is obtained from the marrow after death. The liver shows a very peculiar condition. The spaces between the hepatic cell columns are choked with cells, which, although they were within the capillaries, were not present in blood stream during life. They are normoblasts with fragmented or bunched nuclei, lymphocytes, and granular leucocytes with twisted nuclei. Numerous small myelocytes are present and many mononuclear cells. The capsule of Glisson shows slight fibrosis, its duct epithelium is not abnormal. The liver cells are vacuolated, and contain a golden pigment.

Spleen.—There is moderate fibrosis of reticulum and trabeculæ, and the pulp is stuffed with cells, with many erythrocytes separating the Malpighian bodies, which contain lymphocytes, erythrocytes, and ? normoblasts. Many of the nuclei of the latter are "budding." In the pulp there are also mononuclear basophil cells. Some myelocytes are seen in the pulp and polynuclears. The blood vessels contain multi- and mononuclear cells.

Lymph gland.—A gland from gastro-hepatic omentum shows fibrosis and giant cells. There are many erythrocytes.

Pancreas and kidneys show degenerative changes.

Thymus, thyroid, stomach, and intestines.—Not examined.

Gall bladder.—The mucosa is destroyed; its walls contain many round cells.

No iron or amyloid reaction obtained in any viscus.

PATHOLOGICAL REPORT.—This uncommon type of anæmia or leukæmia (myeloid splenic anæmia) has been described by von Leube (1), Parkes Weber (2), Vaquez and Aubertin (3), Weil and Clerc (4). The clinical symptoms of pernicious anæmia and its characteristic anæmia are combined with blood changes allied to myelocythæmia and enlargement of the liver and spleen. The marrow, spleen, and liver are myelocytic and erythroblastic, and it appears as if the manufacture of red and white cells from erythroblasts and myelocytes in the marrow is supplemented by the spleen and liver. Vaquez and Aubertin say of this disease, "Dans la première affection il y a une sur activité myéloide de la rate specialisée vers la serie blanche, tandis qu'elle est spécialisée vers la serie rouge dans la seconde" (3).

We proffer no explanation of the amount of phagocytocytic activity shown by the giant cells which may have been stimulated by some hypothetical "stimulin," or the elements ingested may have been sensitised by an "opsonin."

Proliferation of bone marrow elements is known to occur in infectious diseases such as smallpox, etc., producing a reaction which differs from the polynuclear one (of defensive character), or of an eosinophilic one (of unknown *raison d'être*) (5).

While A. Jousset claims a bacterial origin for myeloid leukæmia (6), and Bradford and Batty Shaw (9) describe such a factor in acute leukæmia, Banti would regard it as a tumour formation, with or without erosion of the small vessels of the marrow (7).

On the one side it is a problem of blood cell physiology and pathology, and of the life-history of the blood-forming organs; on the other side there may be a factor possibly of the nature of a bio-chemical product acting in small doses over a long period of time, and affecting the reproductive function of the cells in question.

In the absence of evidence of hæmolysis in the tissues, it is fair to conclude that the disease is primary in the marrow, but experimental proof is needed.

The patient's blood had not been examined prior to his admission into hospital. The abdominal swelling had been noticed for ten years, and therefore splenic enlargement had been present presumably for a still longer period. Were we but sure of our facts, it would be interesting to speculate as to the relation between his physical and sexual undevelopment and disease of the blood beginning before the period of normal puberty, and continuing until an age at which development ought to have been complete (10).

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CLINICAL RECORDS.

A CASE OF KERATOSIS OF THE LARYNX.

By A. Logan Turner, M.D., F.R.C.S.E., *Assistant-Surgeon, Ear and Throat Department, Royal Infirmary, Edinburgh.*

The following case illustrates a very rare affection of the larynx which is worthy of being placed on record.

Case.—The patient, A. R., æt. 64, who followed the occupation of green-keeper upon a golf course, was admitted to hospital complaining of hoarseness and some pain in the throat. He had been engaged in this outdoor occupation for ten years, previous to which he had worked as a miner in the coal pits for thirty-five years. He has been subject to asthma for the last twenty years, two of his sisters being similarly affected. His present occupation exposes him to every kind of weather.

About twelve months before his admission he caught a severe cold; since then he has been constantly hoarse. During the last three months he has complained of occasional pain in the region of the larynx. He is also troubled a good deal with cough and some expectoration.

Examination of the nose, fauces, and pharynx showed no abnormal condition. On laryngoscopic examination, however, a very unusual appearance was observed. The upper surface of the right vocal cord throughout its entire length presented an irregular mamillary like appearance,—the free edge of the cord having an irregular outline. Posteriorly this appearance was not confined to the true, but passed without any delimitation on to the upper surface of the false cord. The anterior two-thirds of the left vocal cord showed an exactly similar appearance, but here the condition was limited, the false cord being unaltered, and the posterior third of the true cord showing no alteration from the normal. The affected areas were of a greenish-white colour. On closer inspection, the impression conveyed was that the affected parts were covered by a firm membrane made up of a number of small pin-point excrescences projecting above the surface of the surrounding mucous membrane, not unlike a number of small stalagmites, which could not, however, be separately differentiated the one from the other.

Dr. M'Bride, who saw the case with me, expressed the opinion that it was probably one of keratosis of the larynx. This view was confirmed by microscopic examination. Under cocaine anæsthesia I removed with forceps a portion of the membrane, which was firm in consistence and fairly adherent to the underlying parts.

An examination of the tissue removed was kindly made for me by Dr. T. Shennan. The pathological condition is well shown in the microscopic sections. The excrescences are made up of numerous layers of cornified epithelial cells. Upon the free surface the most superficial layer is becoming broken up into a number of small detached and semi-detached fragments, portions of which have become shed, forming débris. Some of the deeper cornified layers again present a teased-out appearance Towards the base of the excrescence the stratified appearance becomes lost, and a thick layer of epithelial cells is visible. Unfortunately none of the subepithelial tissue had been removed in the forceps, so that its histological appearances are unknown. Here and there upon the surface clumps of branching mycelia are seen, evidently filaments of some form of leptothrix.

While a number of cases of keratosis of the pharynx have been recorded, the occurrence of a similar condition in the larynx, such as has been described above, is comparatively rare. The references in literature are very few. The first published record would appear to have been made by Juffinger in 1891 (*Wien. klin. Wchnschr.*, No. 47), under the title of "Keratosis circumscripta laryngis." The patient was a young woman, æt. 16, in whose larynx a swelling was observed beneath the anterior ends of the vocal cords. It presented a white spiculated appearance, and was hard to the touch. On microscopic examination, the mass was found to consist of numerous layers of cornified epithelium arranged concentrically or in parallel layers. Chiari in 1895 (*Prag. Med. Wchnschr.*) published the second case. The patient was a female, æt. 25. The anterior parts of both of her vocal cords were covered with hard, chalk-white elevations. In 1903, Fein (*Monatsh. f. Ohrenh.*, Berlin, August) recorded two additional cases. The first occurred in a male, æt. 66. The mucous membrane of the larynx was reddened; on the anterior half of the left vocal cord and occupying its upper surface there was a slightly raised spindle-shaped patch of a chalk-white colour, and sharply defined from the surrounding surface. Its long axis lay parallel to the cord: its surface was uneven. Microscopically, it was found to be made up superficially of cornified epithelium. The deeper layers consisted of pavement epithelium. Fein's second case was that of a male, æt. 46, in whom some catarrh of the right pulmonary apex was recognised. The mucous membrane of the larynx was reddened. Upon the middle of the left vocal cord there was an irregularly formed snow-white elevation, measuring 8 mm. in length and half as broad. Its margins were sharply defined. The microscopic structure was the same as that of the previous case. In these cases, as in my own, none of the underlying mucous membrane was removed, so that no histological examination was possible.

There are thus five cases recorded of this interesting laryngeal condition, so far as I have been able to ascertain. Two occurred in females, æt. 16 and 25 years respectively; three occurred in males, æt. 46, 64, and 66. In none of them was there any keratosis of the faucial tonsils, posterior pharyngeal wall, or base of the tongue observed. The authors referred to describe the colouring of the cornified patches as snow-white or of a chalk-like appearance. In my case the affected areas had a distinctly greenish discoloration. In this case, too, the condition was much more diffuse than in any of the others, covering as it did the whole of the right and the anterior two-thirds of the left vocal cord, while the upper surface of the right false cord posteriorly was similarly affected. The microscopic structure was the same in the four cases in which it was described.

CASE OF PUDENDAL HERNIA FOLLOWING CONFINEMENT.

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Cases of hernia at the posterior part of the labium majus are of sufficient rarity to necessitate the recording of every example, even although no further contribution can be made to the precise anatomy of the condition.

The patient presented herself at the Gynæcological Out-patient Room of the Dundee Royal Infirmary, where she was seen by Dr. Buist, who admitted her to his wards. To him I am much indebted for permission to publish the following notes:—

Case.—The patient was æt. 39, and complained of swelling of the vulva of about a fortnight's duration. Her previous health was good. She had been twice married, and had had nine children, five having been born within the last seven years; all her labours had been natural and easy. Her latest confinement took place three weeks before admission, and was uneventful. She got up on the seventh day of the puerperium, and felt quite well except for a transient pain in the left iliac region. Five days later a sensation of discomfort and pain drew her attention to the vulva, which she found to be swollen. There was no history of constipation, or of undue exertion. She was a well-developed and fairly nourished woman, her general condition being rather above the average of hospital patients. In the dorsal position, the left labium majus was observed to be abnormally prominent posteriorly. On the labia being separated, a rounded swelling bulging out the vaginal aspect of the labium, immediately in front of the fourchette, could be clearly seen. On the finger being introduced into the vagina, the tumour was found to be the size of a small plum, and felt tense and cystic, but under considerable pressure could be partly reduced, gurgling being elicited. A distinct impulse on coughing was imparted to the swelling. The neck of the sac, about the thickness of the little finger, could be traced as a firm, cord-like structure, running upwards along the vaginal wall, between the vagina and ischium, to be lost behind the cervix uteri. Operative interference was prohibited by her husband.

Posterior labial herniæ, it is generally agreed, originate from the pouch of Douglas, and two varieties have been described.

1. The pudendal hernia of Astley Cooper, descending between the rectum and vagina, and making its way through the fibres of the levator ani muscle.

2. The ischiatic hernia, of which Winckel describes three subdivisions, according to the muscular boundaries of the neck of the sac; all these issue from the pelvis through the small sciatic foramen, and turn inwards to the labium.

The case under consideration undoubtedly belongs to the former variety. Berger, writing on the subject,[1] inclines to the belief that in such cases there is a congenital deepening of the recto-vaginal peritoneal pouch. In embryonic life the peritoneum descends much farther on the posterior wall of the vagina than is the rule after birth, and persistence of the antenatal condition has been occasionally demonstrated in adults.

It seems reasonable to suppose that in the patient under consideration the frequent stretching and relaxation of the pelvic floor, brought about by repeated parturitions, had a weakening and disintegrating effect on the thin sheet of the levator ani muscle, and that part of the bowel and peritoneum had been forced through. In this connection the after-history is interesting. The patient went home and stayed in bed for a week, the hernia giving no trouble, though persisting. Then, as her strength came back, as she herself expressed it, the swelling disappeared, and had not, three months later, cost her a thought.

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[1] "Traité de chirurgie" (Duplay et Reclus).

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

The Principles and Practice of Medical Jurisprudence. By ALFRED SWAINE TAYLOR. Fifth Edition. Edited by FRED. J. SMITH. London: J. & A. Churchill.

UNTIL the year 1843, when Taylor published his "Manual of Medical Jurisprudence," there was no outstanding and complete work published in this country dealing with the whole subject. The immediate success which it attained, and the world-wide reputation as a medical jurist which Taylor acquired, is a matter of history. After the Manual had rapidly run through several editions, Taylor, in 1865, published a still larger and more comprehensive work, "The Principles and Practice of Medical Jurisprudence," which has become a classic not only in English-speaking countries, but throughout the whole of Europe. It was translated into various languages, and ranks equally with the great works of Casper, Maschka, and Hofmann, in having raised forensic medicine to the position which it at present occupies as an important and separate science.

The attributes which made the "Principles" so popular, and at the same time caused it to be recognised as so authoritative, were the clearness and logic of the writing, the thoroughness and accuracy with which every subject was examined and discussed, and lastly the wealth of illustrative cases, culled from wide reading, but chiefly derived from the author's own unrivalled experience, which helped to throw a striking and often new light upon almost every branch of the subject.

The third and fourth editions, which appeared in 1883 and 1894 respectively, were edited by Dr. (now Sir Thomas) Stevenson, and he was content to bring these editions up to date, without any material alteration in the style and character of the book; so that the master mind and the graphic pen of Taylor was always recognised and felt. Unfortunately, Dr. F. J. Smith has not been able to follow in the same lines. He has "found it necessary to rewrite almost entirely some articles, and to recast the whole plan of the work. He fears that many to whom the old 'Taylor' was familiar may feel themselves somewhat astray in finding their way through the new edition." Of this we have not the slightest doubt, and we regret exceedingly that it should be so.

We freely acknowledge the great difficulty of Dr. Smith's task as editor, but we cannot help thinking that he has attempted in the present volumes to transform the work into a competitor of the many recent text-books for teaching purposes, rather than to maintain it as the standard authority and chief work of reference in the English language. There are many changes. In the first place, each of the two volumes is about a fourth larger in bulk, the result chiefly of a larger type having been employed and of a more liberal spacing.

In both respects this is a distinct improvement, although we cannot say the same with reference to the frequent employment of the tabular method of contrasting such conditions as—bruise *v.* hypostasis—contraction *v.* rigor mortis—the order in which organs putrefy, etc.; or again with reference to the frequent capitulation of "points to be noted."

These savour too much of the modern cram-book, and are scarcely dignified in the classic "Taylor." It may be mentioned that the tabular statements referred to appear for the first time in this edition, and their accuracy is by no means above suspicion and reproach. Secondly, we note a complete change in the arrangement of the chapters and subjects, and to a considerable extent these have been rewritten. Possibly the editor was wise in respect of the rearrangement, although those who were accustomed to deal with the former editions, and knew their way about them, would have been content to see the old order remain.

We cannot, however, acquiesce without a murmur in the rewriting unless it be in connection with those sections dealing with the strictly legal matters which have changed considerably in recent years, and have been much improved by the editor's extensive knowledge.

We fully recognise the perplexities of the problem which Dr. Smith had to face when he undertook the work of bringing out a new edition, but we cannot help expressing the wish that he had been content to follow in the footsteps of Sir Thomas Stevenson, and had merely attempted to bring the various subjects up to date. This latter point, after all, is the chief one. Is the book up to date? In many respects it is, and especially the sections on legal procedure, malpraxis and quackery, lunacy and life insurance, leave little if anything to be desired in a work of this nature.

In some respects, however, it falls very far short of representing recent progress in the science of forensic medicine, and we have searched in vain for references to many foreign publications which have appeared during the last ten years. It is impossible in our limited space to give more than one or two examples of such omissions. In dealing with putrefaction, we find no mention of Mégnin's work upon the fauna of the cadaver. This is a subject which, while it might be considered too advanced for an ordinary student's text-book, yet ought surely to be referred to in a standard reference work upon medical jurisprudence. Not only has Mégnin written upon it, but also Canadian, American, and German authors have dealt with its forensic importance. In the section dealing with drowning, we can find absolutely no reference to the investigations of Brouardel and Loye, of Paltauf, Carrara, Revenstorf, Wachholtz, and others, upon the value of examining the blood in the diagnosis of drowning. There is no more difficult problem than the diagnosis of death by drowning, and some mention of the results obtained by these investigators might reasonably have been expected in a new edition of Taylor.

Again, practical experience has shown that Florence's reaction for seminal fluid, while not an absolute test, yet possesses great value for those conducting such investigations, more especially by its negative rather than its positive results. This test is found worthy of mention in the most recent large work on forensic medicine (Schmidtmann, "Handbuch der Gerichtlichen Medizin"), and both from the practical and scientific point of view ought to have found a place in the present edition. There are many statements, we regret to say, which have caused us considerable surprise, and which, we venture to affirm, are not in consonance with the accepted views of the great majority of authorities. We refer not to statements in the original work which time and experience have shown to require modification, but to some which, so far as we can make out, are to be found only in this new edition.

The following may be cited as examples of what we refer to:—

On p. 286, under the heading "Shifting of Hypostasis," we find: "Owing to the pressure of the gas developed in the blood of a hypostasis, this may be displaced in any direction." We should be glad to know of an authority for this statement that hypostasis may be displaced in any direction by the development of gases in the blood which produces a hypostatic patch. Taylor certainly does not suggest this, as a reference to the fourth edition, p. 57, will show. We also strongly demur to the statement in the following paragraph relating to post-mortem effusions of fluid into serous cavities. These, we are given to understand, are due to the pressure of gases of decomposition forcing the serum from the blood vessels, and again, that they "rarely occur for some weeks." Such effusions are due to simple transfusion in the majority of cases, such as is seen in the earliest stages of putrefaction throughout the whole body, and they are not infrequently observed within a day or two after death.

In the section on hanging, to take another example, we scarcely think the views expressed represent the teaching of the best authorities. It is stated on p. 693 that "the editor is of opinion that such a compression (compression of the carotids) must very rarely if ever take place in accidental or suicidal hanging," and he "is not aware that any observations have been made tending to substantiate the theory." Hofmann—not Hoffmann, as the name is so frequently misspelt—did not "consider that the carotids might be compressed," but in his book ("Lehrbuch der Gerichtlichen Medizin," 8th edition, 1898, p. 496) states that they *are* compressed, and refers to his own experiments. Corroborative experiments were likewise made by Haberda and Reiner and published in 1894, while Brouardel, in his book "La Pendaison," p. 37, says in regard to this question: "Les experiences de Hofmann sont demeurées classiques et j'ai eu souvant l'occasion de les repeter," etc. There are other subjects in which, in our opinion, this edition fails to present the reader with the views of recognised authorities upon points of difficulty and with the most recent advances in the science; and we must conclude, as indeed we believe it to be the true explanation, that the work of editing with complete success such a book as "Taylor," comprising the whole science of forensic medicine, is nowadays beyond the power of one man.

Abdominal Operations. By B. G. A. Moynihan, M.S., F.R.C.S. Philadelphia and London: W. B. Saunders & Co.

This work covers the range of operations performed within the peritoneal cavity excepting such as are included under gynæcology. The operative treatment of hernia and operations on the kidney and urinary bladder are also omitted.

The first section deals with the bacteriology of the alimentary tract, the preparation for abdominal operations, the complications and sequels of these, and the different incisions and methods of suture applicable to the abdominal wall. There are then considered in order the treatment of acute peritonitis, tuberculous peritonitis, subphrenic abscess, prolapse of the viscera, ulcers of the stomach and duodenum, gastric hæmorrhage, and cancer of the stomach. The third section deals with operations upon the intestines, including the vermiform appendix; the fourth section, with operations upon the liver; and the final section, with diseases of the spleen and pancreas.

The book is not a mere compilation of abdominal operations; each diseased condition which calls for interference is considered in sufficient detail to prepare the operator for what he is likely to find within the abdomen. The different operative procedures are admirably described and illustrated. The author's style is dogmatic and forcible—such as carries conviction that he can operate, as well as write about operations. The frequent repetition of "I," "my," "myself," and "my own" is for the most part unavoidable, but might have been toned down here and there, especially when the personal pronoun refers to opinions and methods which are not peculiar to the author. We do not suggest that Mr. Moynihan is unfamiliar with the work of other surgeons in the same field, for there is scarcely a page without such reference;—in fact, the only apparent omission among the authorities quoted is that of Lennander of Upsala.

The reader will not be suprised to find it stated that the interest in bobbins and buttons is now only historical. The care of the teeth and mouth as a preliminary to an abdominal operation is very properly emphasised, as it has not, in this country, received the attention which it deserves. Rubber gloves are worn by Mr. Moynihan at all operations, one of the many details of technique which he has adopted from our American confrères; he is also a convert to iodine catgut, and still believes Pagenstecher's celluloid thread is superior to silk. His views on the treatment of acute peritonitis by flushing and drainage are those held by the majority of surgeons.

Gastric and duodenal ulcers receive the thorough consideration which was to be expected from one who has written so much and so frequently on the subject. It would appear that Mr. Moynihan has never met with any difficulty arising from the anæsthesia while operating for perforated ulcer of the duodenum, as there is no mention of it in the record of his cases.

The description of the operation of gastro-enterostomy is better than in any similar work with which we are acquainted. The author's experience in malignant disease of the stomach is apparently not so extensive as in the innocent affections, but the operations performed for its relief are also admirably described and illustrated.

The work is remarkably free from minor errors; we have noticed only two words—"pajamas" and "vise" (p. 69)—which might have been spelled differently, and only a few illustrations which fall behind the uniformly high standard achieved, under the author's directions, by the artist, Miss Ethel M. Wright: No. 13, illustrating a right subphrenic abscess, exhibits a displacement of the liver which does not harmonise with the physical signs of the lesion in question; and fig. 80, which illustrates gastrostomy by Witzel's method, makes the tube emerge near the cardiac end of the greater curvature of the stomach.

Mr. Moynihan's book is to be strongly recommended. If we except the English translation of Kocher's *Operationslehre*, there is no English work of which it can be said that it gives a really good account of the abdominal operations practised at the present day. The author's task was a difficult one, and he has performed it admirably.

Lectures on Tropical Diseases. By Sir Patrick Manson, M.D. London: Archibald Constable & Co.

These lectures, ten in number, constituting the Lane Lectures for 1905, were delivered at the Cooper Medical College, San Francisco, in August 1905, and are now published in book form.

In the preparation of such a set of lectures it must have been a difficult task to decide what line to pursue, for it was quite impossible to cover the whole field of tropical diseases in such a limited number of lectures. The task was happily accomplished by selecting for consideration those diseases most likely to be encountered by the men who constituted the audience, as ankylostomiasis, filariasis, and other parasitic diseases, with malaria and tropical fevers in general, special reference being made to some of the most recently described diseases, as sleeping sickness and kala azar.

Time did not admit of the subjects being treated in great detail, but doubtless the lecturer succeeded in the object which—as stated in the first lecture—he had in view, "interesting you in some of the tropical problems I shall touch upon, and giving you some hint that may help you in diagnosis and treatment."

The principles determining the geographical distribution of tropical diseases are considered on broad lines. The description of the altered conditions which are likely to follow the opening of the Panama Canal and will probably affect San Francisco more than any other place, must have deeply interested the audience.

The most interesting portions of the book are the chapters devoted to the diagnosis and treatment of the different diseases. Many cases are described in detail to show how difficult it is at times to arrive at a correct diagnosis in tropical cases, and how easily mistakes may be made. The hints on treatment are, from the author's great experience, specially valuable.

The illustrations are numerous, many of them original, and they are, with some few exceptions, most excellent. The book should find a wide circle of readers, for while it will be read with pleasure and profit by medical men both at home and abroad, certain parts of it may be commended to the notice of those responsible for the general administration of colonies and dependencies in tropical countries.

Nouveau Traité de Médecine et de Thérapeutique. III. "Fièvre Typhoïde," par P. BROUARDEL et L. THOINOT. Paris: J. B. Baillière et Fils.

THE third fasciculus of Brouardel and Thoinot's great treatise is devoted entirely to the consideration of typhoid fever, and, as was to be expected, is written by the editors themselves. Since the publication of the first edition, much new work has been done on the subject, and the article is therefore considerably expanded, and has been well brought up to date, although it is not nearly so full as the well-known monograph on the same subject by the same authors. It has, however, the advantage of containing references to all the most recent work, and gives as full an account of typhoid fever as anyone can reasonably require.

The new matter contained in this edition is chiefly in connection with the researches of Sanarelli, Chantemesse, and others, who have endeavoured to isolate typhoid toxins and antitoxins. The authors do not hold with Sanarelli's view that the lymphatic system is first invaded, and that the intestinal symptoms are due to the excretion of toxin, and that afterwards the *Bacillus coli* becomes virulent, and secretes in its turn an active toxin. Reference is made to the work of Balthazard and Vincent, and it may be said that this section of the treatise gives a very good idea of our present knowledge of these difficult questions. A careful search through the book, however, failed to find any reference to Wright's work on Typhoid Vaccine, either experimental or clinically as a prophylactic. This seems a somewhat unfortunate omission at a time when the Germans are reporting favourably on the use of vaccine in South-West Africa; and whether the authors find themselves able to agree with Wright's view or not, surely some notice should have been given of this important and interesting subject. The section on diagnosis is very good, and a description is given of the various laboratory methods. The authors say rightly that the cultivation of the bacillus from the blood is at present a method "de luxe," and that the methods of cultivation from the spots or by puncture of the spleen are of little practical value, the latter being absolutely dangerous. For cultivation from the stools the method of Drigalski and Conradi is preferred to that of Elsner, full details of both being given. Widal's reaction is fully discussed, and, as regards the diazo reaction in the urine, the authors follow Ehrlich in concluding that its absence from the fifth to the tenth day in a suspected case practically excludes a diagnosis of typhoid fever, a conclusion which is quite in accordance with our own experience.

On the question of treatment, the authors speak hopefully, but with caution, of the serum recently introduced by Chantemesse. They consider that the real function of the cold bath is its use in very severe cases only. Useful suggestions regarding antipyretic, antiseptic, and diuretic systems of treatment conclude a most interesting volume.

Diseases of the Ear, for Practitioners and Students of Medicine. By James Kerr Love, M.D., Aural Surgeon, Glasgow Royal Infirmary. Bristol: John Wright & Co.

The author of this volume must be congratulated upon the result of his labours. He has produced a most readable book, and one which we can confidently recommend to the favourable notice of the profession. During recent years, a number of text-books, varying in merit, have appeared dealing with diseases of the ear, but we have no hesitation in describing the present work as a sound practical treatise. The text is not over-burdened with references to literature, the author having evidently aimed, and in our opinion successfully aimed at providing the student and practitioner with information to a large extent based upon his own experience.

One of the features of the book is its illustration by the reproduction of a series of stereoscopic photographs. The plates are of a large size, consequently the volume is a little cumbersome for the reader. There is no question, however, of the value of stereoscopy for purposes of anatomical teaching, and Dr. Love's book is an excellent example of this method applied for clinical purposes.

The whole field of ear disease has been covered by the author, and though here and there one notes some inequality in the amount of detail which is given to parts of the subject, as, for example, the surgery of the labyrinth, it does not detract from the general merit of the text. The author has made a name for himself in connection with the subject of deaf-mutism, consequently his chapter dealing with it is worthy of careful perusal.

Transactions of the Twenty-seventh Annual Meeting of the American Laryngological Association. 1905.

Some of the most interesting and valuable papers dealing with the affections of the nose and throat which appear in American literature are to be found in the *Transactions* of this Association. We make this statement without casting any reflection upon the work done by other similar societies. In the present volume we would specially mention the work of Dr. Otto Freer upon the treatment of deflections of the nasal septum, and the thesis of Dr. George B. Wood on the lymphatic drainage of the faucial tonsils, both of them meriting careful perusal. The papers and discussions upon suppuration in the accessory nasal sinuses give an excellent review of the present-day position of the surgery of these cavities. We congragulate the Association upon its continued vitality.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Affections of the Intestines.

Enterogenous Cyanosis.—This name has been given to a recently recognised symptom-complex, the characteristic features of which are cyanosis (such as is seen in chronic lung or congenital heart lesion) associated with intestinal disease. Attention was first drawn to it by Stokvis and Talma, while papers on the subject have been published since by Hymans van den Bergh and Grutterink (*Deutsches Arch. f. klin. Med.*, Leipzig, 1905, Bd. lxxxiii. S. 86, and *Berl. klin. Wchnschr.*, 1906, January 1) and Cheinisse (*Deutsche Med.-Ztg.*, Berlin, 1906, January 11). Stokvis's original case was a soldier who for two or three years had suffered from intractable diarrhœa. The three prominent features of the case were, very marked cyanosis of the skin and mucous membranes, persistent diarrhœa with flagellata in the stools, and the presence in the urine of a body which gave a ruby red colour with phosphoric acid, and converted oxy-hæmoglobin into met-hæmoglobin. It was inferred by a process of exclusion that the cyanosis was not due to stasis or deficiency of oxy-hæmoglobin, but to met-hæmoglobinæmia. Post-mortem examination showed ulcerative enteritis, and Stokvis supposed that the cyanosis was due to the absorption of toxic matter from the bowel, which changed part of the hæmoglobin into met-hæmoglobin. In Talma's three cases there was also diarrhœa with fœtid motions, quantities of indol and skatol in the urine, and widespread cyanosis. The blood gave the spectrum of met-hæmoglobin, in two cases in the corpuscles alone, in one, in the plasma also. In one patient the urine had the power of converting oxy-hæmoglobin into met-hæmoglobin. Bergh and Grutterink have added considerably to our knowledge of this rare condition. They have had the good fortune to come across a series of cases, and find that two forms of enterogenous cyanosis can be distinguished,—in one the colour is due to met-hæmoglobin, in the other to sulpho-hæmoglobin. Their first case of *sulpho-hæmoglobinæmia* is in many respects interesting. The patient was a boy, æt. 9, who was operated on at birth for atresia ani, with the result that a stenosis of the anus and a urethro-rectal fistula were produced. Since infancy he had suffered from diarrhœa with fœtid stools, which were passed partly by the bowel, partly by the urethra. For many years he had been intensely cyanosed, showing clubbing of the fingers and toes, while the blood, both after withdrawal, and as seen by transillumination of the ear, gave the spectrum of sulpho-hæmoglobin. The blood contained 5,200,000 red corpuscles and 20,000 leucocytes. The cyanosis caused no dyspnœa or apparent discomfort. In the fæces a substance was found which converted oxy-hæmoglobin into sulpho-hæmoglobin. Here the cyanosis was regarded as due to abnormal production or retention of hydrogen sulphide or its combinations in the bowel, and their absorption into the blood. Systematic catheterisation to prevent the urine entering the bowel and undergoing ammoniacal decomposition there, dilatation of the anus, and regular emptying of the intestine, abolished the cyanosis temporarily, but as it recurred when treatment was discontinued, the fistula was closed and the anus dilated by operation, which led to a permanent cure. An interesting point is that after the relief of the cyanosis the clubbing of the fingers and toes completely disappeared in a few months. The remaining cases of sulpho-hæmoglobinæmia which Bergh has studied have all had in common retention of the contents of the bowel. Two fresh examples of *enterogenous met-hæmoglobinæmia* have also been observed. Both were in adults, who had suffered for a number of years from chronic enteritis, in one associated with choleraic seizures and collapse. In both the patients (whose thoracic organs were quite sound) marked cyanosis was apt to develop periodically, at which times the blood gave the spectrum of met-hæmoglobin. In both men it was possible at will to produce the cyanosis and cause it to disappear by altering the diet. After twenty-four hours of milk diet the colour of the skin and spectrum appearance of the blood become normal, while by giving a mixed meal at midday, cyanosis was produced by evening. Investigations were made on the nature of the substance causing the met-hæmoglobinæmia. Attempts to isolate it from the stools (which reduced hæmoglobin) were discontinued, because it was found that the same property was possessed by diarrhœal motions from patients with no cyanosis. By a laborious series of analyses, Bergh and his co-worker showed that the blood withdrawn during an attack of cyanosis contained nitrites. The nitrites are fixed to the corpuscles, not free in the plasma, which accounts for the fact that the blood serum does not produce met-hæmoglobin when added to the blood of normal persons. All the patients suffered from attacks of headache, and a feeling of paralysis in the limbs; it is possible that this may have been due to the presence of nitrites in the circulation. It remains an open question whether the occurrence of these substances in the blood is due to increased absorption or excessive production. We know that many bacteria, among them *B. coli*, produce nitrites. [A noteworthy point in this rare form of cyanosis is that it is not accompanied by hyperglobulia, while the fact that it produces clubbing of the fingers and toes, which passes off as the blood again becomes normal, is also remarkable.]

The Rhythmic Sounds of the Alimentary Canal (Cannon, *Journ. Amer. Med. Assoc.*, N.Y., 1906, January 20).—So long as the nature of the gastro-intestinal movements was undetermined, the sounds produced in the abdomen could not be discriminated, but now that these movements are known—in the stomach, successive rhythmic peristaltic waves; in the small intestine, rhythmic segmentation of the food; in the ascending colon, rhythmic antiperistaltic waves toward the cæcum—Cannon has studied the sounds produced, both by the stethoscope, and in tracings got by a recording telephonic transmitter, which eliminates the personal factor. The most favourable food for producing sounds is such as contains air in fine division—*e.g.* slightly chewed toast or porous bread.

Stomach sounds.—These are best heard over the pylorus, at the tip of the right eighth rib. They are loud, rattling, and explosive, occurring once every twenty seconds or so, and correspond with the rhythmical increase in the pyloric pressure, which Moritz found took place at similar intervals.

Sounds of the small intestine.—On auscultation over the lower part of the abdomen a confused noise is heard. The sounds of the small intestine are most easily discriminated when the stomach is empty, in the early morning, and over the left lower quadrant of the abdomen, away from the active part of the colon. The rhythmical sounds of the small intestine are not rattling and explosive, but softer and more rolling, rising and falling in intensity; they last for from four to five seconds, and recur at intervals of seven to eight seconds. They do not move on as a peristaltic wave would do, but persist for some time in the same place.

Sounds of the large intestine.—There is no periodicity about the sounds of this part of the bowel. They are coarse and rumbling, best heard over the active, churning, ascending colon, and recur at intervals varying from fifteen to forty-five seconds. The paper is illustrated by tracings of the sounds.

Idiopathic Dilatation of the Colon.—Megalocolon congenitum, or, as it is also called, Hirschsprung's disease, is a somewhat rare condition which has been known for a number of years, but recently a good many communications on the subject have appeared, among them a general review by Zesas (*Fortschr. d. Med.*, Berlin, 1906, January 10). The dilatation occurs without recognisable anatomical obstruction, and is most common in males. Among forty-eight collected cases the malady was congenital, or developed in early infancy in forty-three. The dilatation may involve the whole colon, or only one or more segments of the gut. The sigmoid flexure is almost always affected; next in frequency comes the transverse colon, while the small intestine very rarely participates in the dilatation. The wall of the dilated bowel is hypertrophied; its mucous membrane often ulcerated. The distended portion may attain enormous dimensions, and resemble the intestine of an ox; it contains large quantities of fæcal matter. Clinically, Hirschsprung's disease shows itself by constipation and distension of the abdomen. The former is very obstinate; in some cases the bowels never open spontaneously, in others only at intervals of days or weeks; flatus is, however, passed freely and even in excess. The distension of the abdomen may be so great as to cause dyspnœa and cyanosis, and require puncture. Sometimes enemata give relief to the symptoms, but recurrent obstruction, ultimately proving fatal, is to be dreaded. Along with the distension, visible peristalsis is also present in most cases. The course of the malady is often protracted; thus serious obstruction sometimes occurs only in late adolescence, and a fatal attack may be warded off for many years. The prognosis, however, is always serious. In thirty cases analysed by Duval, death occurred within the first six months in 11 per cent., from six to twelve months in 7 per cent., from one to five years in 23 per cent., from eight to fifteen years in 11 per cent., above fifteen years in 16 per cent. Obstruction and acute colitis are almost equally frequent as causes of death. The nature of the malady has been much discussed. It has been regarded as a congenital malformation comparable to congenital dilatation of the œsophagus. Apparently, however, the affection is sometimes acquired in later life, though it is difficult to perceive what can bring about such a condition. Were retention of fæces a sufficient cause, the disease would be much commoner than it is. Spasm of the anus, along with a congenital tendency to constipation, is one theory proposed. It is uncertain whether in these cases the colon is primarily unduly long, or abnormal in position. The fact that the symptoms may not develop until after childhood does not disprove the congenital origin of the malady, which may only make itself evident when the musculature of the bowel becomes insufficient to propel the intestinal contents onward. It is not even certain to what extent the hypertrophy of the wall of the bowel is primary, or how far it may be secondary to the dilatation. Some contend strongly that a mechanical block—*e.g.*, spasm, moderate degree of contraction of the colon, valvular obstruction, or volvulus—is always present; others, that the condition of the wall of the bowel is the result of chronic inflammatory changes. There seems no doubt that in some cases valvular obstruction does occur when the malady is well developed, but the fact that this is not at all constant suggests that, as may readily be understood, such obstacles are secondary to, and only serve to increase, dilatation which already exists. The preponderance of the male sex among sufferers is a fact which is best accounted for on the assumption of a congenital malformation, which may bear some relation to the development of the uro-genital tract. The treatment consists in restricting the diet to what will leave little residue, and systematically emptying the bowel by enemata. Purgatives are harmful, and massage and electricity of little use. Various plans of surgical interference have been tried. When any mechanical obstacle arising from malposition is present, colopexy has been found beneficial. Anastomoses between the ileum or transverse colon and rectum have had good results in some cases. In other cases, excision of the dilated part of the colon has been tried. Colostomy sometimes admits of better drainage of the bowel.

Stirnimann (*Centralbl. f. schweiz. Aerzte*, 1905, September 15) records a typical case, fatal at the tenth month. Other malformations, —a 5-lobed right lung and accessory spleen—were also found. The author thinks that operation should be avoided during the first two years; it is better to temporise and try and maintain the patient's strength until he is older. Three forms of malformation of the colon may be distinguished—(1) Elongation, (2) local or general dilatation, (3) dilatation with hypertrophy. In Stirnimann's case the dilatation and hypertrophy were first noticed in the sigmoid flexure, and spread back until the whole gut was affected. There was no mechanical obstruction. Bittorf (*München. med. Wchnschr.*, 1906, February 6) reports a case fatal at the unusually early age of 19 weeks. Here there was a partial narrowing of the bowel below the dilated part. The stricture had a lumen of nearly 1 cm., and the wall was thickened, but showed no signs of scar tissue.

SURGERY.

UNDER THE CHARGE OF

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Peptic Ulcer of the Jejunum following Gastro-Enterostomy.

The satisfactory results obtained from the operation of gastro-enterostomy in non-malignant affections of the stomach are now fully appreciated. A. Gosset of Paris (*Rev. de chir.*, Paris, 1906, January) draws attention to an after-effect of this operation, which in a certain proportion of cases leads to serious consequences. He has collected records of thirty cases, mostly reported by German surgeons, in which peptic ulcers of the jejunum developed and threatened the life of the patient, when they did not actually prove fatal. Sex, age, and the particular operative procedure adopted do not appear to have any important bearing on the question. The peptic ulcer of the jejunum differs in no way from that of the stomach or duodenum. It is usually single, but in some cases there have been several. It is most frequently situated on the descending loop of the small intestine near to the opening into the stomach. Clinically, the ulcer may manifest itself in one of three ways—(1) By determining perforation of the bowel, without any premonitory signs, the patient exhibiting all the acute symptoms associated with perforation of a gastic ulcer into the general peritoneal cavity. (2) In a second group of cases there has been a localised peritonitis with adhesions between the affected loop of bowel and the parietal peritoneum. This is the most common form, and it frequently ends in the formation of a fistula on the anterior abdominal wall. (3) Three cases have been reported in which the ulcerated area of the jejunum formed attachments to the transverse colon, with the result that fistulous openings formed between them. The establishment of this communication resulted in rapid emaciation, profuse diarrhœa, and fæculent vomiting.

According to Gosset, the diagnosis of peptic ulcer of the jejunum is seldom difficult. The danger is that the possibility of its occurrence may be overlooked, and the symptoms to which it gives rise are then attributed to a wrong cause. The author emphasises the importance of the surgeon bearing in mind the possibility of peptic ulcer when any untoward symptoms develop after gastro-enterostomy for a non-malignant affection. If, for example, symptoms of acute perforative peritonitis develop, this is the most likely cause, and the ulcer will usually be found close to the gastro-enterostomy wound, most likely in the descending loop of jejunum. The recurrence of digestive troubles, pain, vomiting, and hæmatemesis may be explained by the formation of a peptic ulcer in the jejunum, and this diagnosis is supported if an area of induration develops in the epigastrium. A sudden onset of pain, emaciation, diarrhœa, and fæcal vomiting suggests that the ulcer has perforated into the transverse colon. The development of these ulcers seems to be confined to cases in which gastro-enterostomy has been performed for non-malignant conditions. There is almost always marked hyperacidity; advanced stenosis of the pylorus and great dilatation of the stomach in the cases in which peptic ulcers form. With regard to treatment, Gosset recommends that medical treatment should be continued for a long time after the operation has been performed, and that special attention should be directed towards the hyperacidity and gastric dilatation. By such measures the occurrence of the ulcers may be prevented. When the ulcer has formed, the treatment obviously depends on which of the three above-mentioned groups it belongs to. When perforation occurs into the general peritoneal cavity, immediate laparotomy must be performed on the same lines as in perforated gastric ulcer. When a fæcal fistula forms, it must be closed, and a fresh communication between the stomach and intestine may be necessary. When a fistulous opening has formed between the jejunum and the colon, these loops of bowel must be separated and the opening in each closed.

ON IMPACTION OF COINS IN THE ŒSOPHAGUS IN CHILDREN.

CAUBET (*Gaz. d. hôp.*, Paris, 1906, January 25) discusses the means of extracting coins from the œsophagus of children by the natural channel. He points out that the use of the X-rays has shown that the seat of impaction is nearly constant, namely, at the level of the upper limit of the thorax. In a radiogram the shadow of the coin is seen just above the sternum, and a line drawn from one clavicle to the other usually crosses the centre of the coin. The shadow usually hides the last cervical and first dorsal vertebræ. The author notes, what has previously been remarked by Leriche, that the coin seems to lie to the *right* of the middle line, in spite of the statement of anatomists that at this level the œsophagus deviates to the left. The explanation of this localisation is that at the level of the fourth dorsal vertebra there is a natural constriction of the œsophagus caused by the crossing of the aortic arch, and above this is a fusiform dilatation in which the coin lodges. Kirmisson has pointed out that in this dilated portion of the œsophagus the coin lies against the anterior wall of the tube, while behind it there is an open space which permits of the food passing on, and this explains how children are able to swallow fluid food in spite of the presence of a coin in the œsophagus. The distance from the upper incisor teeth to the lower border of the coin is, in an infant, about 15 cms. For purposes of diagnosis, the author recommends that reliance be placed entirely on radioscopy. The use of bougies is deprecated as uncertain and sometimes harmful, while œsophagoscopy is difficult, and requires special training and much practice before it can be satisfactorily employed.

As regards the means of removing these foreign bodies, the author advises that in all cases in which not more than fifteen days has elapsed since impaction took place, an attempt should be made to extract the coin by the natural passages. He does not favour the ordinary coin-catcher of Graefe, which he considers too large for the purpose, and, the recurved part being movable on a hinge, the anterior angle of the instrument is very liable to catch on the lower border of the cricoid cartilage. Numerous accidents have been reported in the use of this instrument. He prefers the single hook introduced by Kirmisson, which is smaller and more easily managed. External œsophagotomy is rarely indicated for the removal of coins. It is only necessary when the body has been impacted for a long time and when the walls of the œsophagus are softened by the pressure exerted by it, or by secondary inflammatory changes.

Gonorrhœal Stricture of the Rectum.

Arnaud (*Gaz. d. hôp.*, Paris, 1906, February 3) contributes a paper in which he shows that stenosis of the rectum as a result of gonorrhœal infection is more common than is usually suspected, and that many cases hitherto supposed to be of syphilitic origin are in reality due to gonorrhœa. The gonorrhœal infection may be primary and direct, or it may be due to discharge from the urethra or vagina passing back and reaching the rectal mucous membrane. It has frequently occurred as a sequel to vulvo-vaginitis in little girls. Gonorrhœal stricture is met with much more frequently in women than in men. The stenosis is the result of the inflammatory reaction associated with gonorrhœal infection of the mucous membrane, followed by ulceration. This inflammatory reaction is extremely chronic and intractable. The clinical features are those common to all forms of inflammatory stricture, and the condition may be complicated by ano-rectal fistulæ, peri-rectal cellulitis, and suppuration. It is usually very difficult to make an absolute diagnosis unless gonococci be found in the discharge from the rectum. Treatment is carried out on the same lines as for other forms of inflammatory stricture.

The Operative Treatment of Cleft Palate.

Charles N. Peck (*Ann. Surg.*, New York, 1906, January) records his experience in the treatment of cleft palate. He considers the operation of Langenbeck the procedure of choice in nearly all cases, either in adults or children. As regards the age at which the operation should be undertaken, he says the earliest age to operate is from six to ten years, although he admits that "the best age probably is from two to three years, if it can be demonstrated that the danger is not too great." The bellies of the levator and tensor palate, with their insertions into the palatine aponeurosis, should be preserved; but the attachment of the aponeurosis to the posterior margin of the hard palate must be divided, together with the mucous membrane on the nasal aspect of the velum. He has found a device suggested by C. H. Mayo useful in relieving tension. After the sutures have been tied up, and the edges of the palate thus brought together in the middle line, a piece of white tape is passed around both flaps through the lateral incisions, drawn just tight enough to approximate the flaps slightly, and to guard against tension, and secured by a silk ligature. The ends are cut short and shifted round to the nasal aspect of the flaps. This is left in place for seven days, and serves for drainage as well as for the relief of tension.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF
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A Rare Form of Uterine Sarcoma.

Wenczel (*Centralbl. f. Gynäk.*, Leipzig, 1905, No. 49) states that sarcoma is a rare form of malignant disease of the uterus. Gurlt found two cases among 2649 uterine tumours, of which 1572 were carcinomata and 883 fibromata. It generally occurs in the body of the uterus. Poschman found 377 cases of cervical cancer, against ten of the corpus uteri; while there were eleven sarcomata of the fundus to five in the cervix. In most cases sarcomata arise from the mucous membrane; if from the uterine wall, the growth is generally a degeneration of a fibromyoma. The type is generally spindle-celled. Wenczel describes a case originating in the cervix. It started from the uterine wall as a primary growth, and not as a degenerated fibroid. The patient was 46; the tumour projected into the vagina, and was removed by vaginal hysterectomy.

The Technique of Pubiotomy.

Pfeilstickler (*Centralbl. f. Gynäk.*, Leipzig, 1905, No. 48) advocates the subcutaneous operation. A puncture is made in the labium majus of sufficient size to admit a blunt-pointed needle. The needle is passed close to the bone, internally to the crus of the clitoris, so as to avoid hæmorrhage. It is best to pass the needle from below upwards. The insignificant wounds are dressed with iodoform and cotton, and an Esmarch's bandage applied round the hips.

Hysterectomy in Acute Puerperal Septicæmia.

Cumston (*Am. Journ. Obst.*, N. Y., 1905, November) concludes that there are certain cases of puerperal septicæmia which might be saved by removal of the uterus, but there are no absolute signs which will allow one to proceed with certainty. Acute septicæmia, on account of its rapid development, is never an indication of the operation, but in secondary septicæmia which has developed slowly, good results may be obtained. No assistance in deciding the question can be obtained from bacteriological examination of the blood or lochia, but cytological examination of the blood may furnish a basis for a reliable prognosis.

INTERMENSTRUAL FEVER.

VAN VOORNFELD (*Ztschr. f. Tuberk. u. Heilstättenw.*, Leipzig, 1905, October) describes the case of a patient, æt. 18, who was found to have a rise of temperature regularly on the fourteenth day after the commencement of each menstrual period, and which continued for one or two days. The patient was phthisical, and although the onset of the fever caused malaise, it was otherwise unaccompanied by symptoms, such as increase of cough or expectoration. The lung condition could not be the sole cause of the phenomenon, and there was no evidence of tuberculous tubal disease. Van Voornfeld thinks the fever is to be regarded as a more or less normal condition, a sign of a periodical intermenstrual hyperæsthesia of the heat centre.

PRIMARY CHORIO-EPITHELIOMA OF THE TUBE.

RISEL (*Ztschr. f. Geburtsh. u. Gynäk.*, Stuttgart, 1905, vol. lvi.) has collected eleven cases of this condition associated with tubal pregnancy, whereas over 300 examples following on uterine pregnancy have been reported. Risel's own case was as follows:—P., æt. 35, last pregnancy five years before coming under observation. She had been troubled with irregular hæmorrhages and abdominal pain for three months. A tense elastic swelling was found in the left fornix diagnosed as an ovarian cyst or pyosalpinx. The patient died four months after operation from rapid recurrence of the growth. The tumour, which proved to be a chorio-epithelioma, originated in the left tube. Metastatic growths were found in the lungs and liver, histologically the same as the tubal swelling.

HYPERTROPHIED KIDNEY REMOVED DURING PREGNANCY.

SCHAUTA (*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, 1905, November) reports a case where hydronephrosis was supected in a patient, æt. 21. At the second month of pregnancy a tumour the size of a man's head occupied the right lumbar region. The tumour proved to be a hypernephroma, and was removed together with the normal portion of the kidney. The remaining kidney functioned well after the operation.

DERMOID OVARIAN CYST SIMULATING FLOATING KIDNEY.

ISAACS (*Med. Rec.*, N. Y., 1905, December 30) reports the following case:—P., æt. 19, was admitted to hospital with acute abdominal symptoms. A tumour in size, shape, and consistence like a kidney was found in the right side of the abdomen. It was freely movable, so that it could be pushed upwards under the ribs, and downwards into the pelvis. There had been some vesical irritability, but urinary examination was negative. The tumour was exposed by an incision outside the right rectus muscle, and proved to be a dermoid ovarian cyst, with a twisted pedicle 7 in. long.

Intra-ligamentary Urinary Bladder.

Natanson and Linner (*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, Bd. xxii. Heft 5) refer to the malformation of the bladder where it develops in such a manner as to more or less distend and separate the layers of one or both broad ligaments. They describe fully four well-illustrated cases. Although not of great clinical interest, nevertheless such a condition might give rise to very puzzling appearances if met with in the course of an abdominal operation.

Intermittent Hydrosalpinx.

Findley (*Am. Journ. Obst.*, N. Y., 1906, February) reports the following case:—P., æt. 25, admitted to hospital complaining of pelvic pain, with a history of gonorrhœal infection two years previously. On examination there was found a swelling to the right side of the uterus the size of a child's head—round, cystic, tender, and fixed. From the cervix there exuded purulent secretion. Two weeks later the swelling could not be detected, which led to the belief that it had burst into the free peritoneal cavity. The patient stated that after the escape of a large amount of watery fluid from the vagina, there was relief of the pressure symptoms. The abdomen was opened, and the right tube was found as a thin-walled collapsed sac, with no rupture in the wall. The appendages on the opposite side were normal. Findley refers to other reported cases.

THERAPEUTICS.

UNDER THE CHARGE OF

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On the Nature of the Tolerance for Arsenic.

Cloetta (*Arch. f. exper. Path. u. Pharmakol.*, Leipzig, 1906, Heft 3) has studied this question in rabbits and dogs. He finds that it is not very easy to obtain a high degree of tolerance if the arsenic is given in solution, but if the arsenic be given in solid form by the mouth, a very high degree of immunity may be reached. Thus, in one experiment, a dog was given arsenic at first in the form of solution. Starting with ½ mgrm., this amount was gradually increased, so that at the end of eleven months the dog was receiving 25 mgrms. daily. The attempt to increase the dose still further proved unsuccessful, as the animal refused to take any more in fluid form. On the other hand, on administering the arsenic in the form of powdered arsenious acid, the amount could be greatly increased. At the end of another six months the daily dose had risen to 500 mgrms. = 7½ grs. Seven months later the amount given had risen to 800 mgrms. This dose was suddenly raised to 1500, and after ten days a further rise to 2500 mgrms. = 37 grs. was successfully accomplished. Analyses of the urine at different stages during the twenty-one months that the experiment lasted showed that, with the increasing doses, the amount of arsenic given off in the urine steadily fell. The conclusion, therefore, was that the immunity established was the result of a local action on the part of the intestine, which acquired the power of absorbing less and less of the drug. To clinch the experiment, he injected subcutaneously the ordinary lethal dose for a dog of the same weight, *i.e.* 40 mgrms. Though this amount represented only the sixtieth part of the daily amount to which it was accustomed, the smaller dose proved fatal in five hours, with the ordinary post-mortem findings of acute arsenical colitis. Despite the enormous doses, the liver and brain only contained small quantities of arsenic, proving conclusively that only infinitesimal portions of the arsenic were absorbed.

The following table shows clearly the progressive diminution in the amount of arsenic absorbed as tolerance was established :—

Daily Dose by the Mouth.		Excreted in Urine in Twenty-four Hours.	Percentage of Dose Absorbed.
	25 mgrms. . .	5 mgrms.	20 per cent.
	100 ,, . .	2·3 ,,	2·3 ,,
	500 ,, . .	19·3 ,,	3·8 ,,
Two months later	500 ,, . .	9·7 ,,	1·9 ,,
	2500 ,, . .	6·2 ,,	0·25 ,,

Cloetta considers that it is irrational to attempt to produce an increasing effect on the body by administering increasing doses of solid arsenic by the mouth. If it is necessary to produce this action, the arsenic had better be given in solution, as the local immunity (power of avoiding absorption) is not marked for dissolved arsenic. The only certain way, for long courses, of intensifying the arsenical action is by the use of increasing hypodermic injection of correspondingly smaller quantities.

Intestinal Disinfection.

Hoffmann finds that isoform (paraiodoanisol) is the most powerful intestinal antiseptic which we possess. He tested its effect in a series of patients who suffered from fæcal fistula and gastric disorders. His usual procedure was to estimate the number of colonies produced by the inoculation of a loopful of fæces before and after the administration of isoform. He found that isoform uniformly diminished the number of the germs. The drug was given in the form of hardened capsules, and as softer capsules. In powder form, isoform exerts its disinfecting action in the stomach in a few minutes. The softer capsules take from one to one and a half hours to dissolve in the stomach, while the hardened capsules only dissolve when they reach the intestine. The length of time that the inhibiting action lasts depends on the size of the dose, the amount of peristalsis, and the relation to food. In most cases the effect is still evident thirty hours after administration. The drug can be given in large doses. A strong man may take as much as 8 grms. during twenty-four hours without ill effect. Women require smaller doses. An average daily dose seems to be about 4 to 6 grms. If large doses are continued for some time, they cause loss of appetite, nausea, and a tendency to vomit. These symptoms seem to depend largely on the peculiar taste and odour of the drug, and cease on stopping it. Hoffmann has not noticed any distinct irritant effect on the intestinal mucous membrane. He recommends the disinfection of the intestinal canal before surgical operations. In these cases, if time permits, the drug should be given for two days before the operation. For medical cases, the drug is likely to prove useful in conditions where there is a parasitic infection of the intestinal canal.—*Mitth. a. d. Grenzgeb. d. Med. u. Chir.*, Jena, 1906, Heft 5.

The Effect of Testicular Extract on Growth.

Dor, Maisonnave, and Monziols, at the meeting of the Société de Biologie of 6th January, communicated the results of certain experiments which they have carried out on young rabbits. They find that the subcutaneous injection of orchitic juice distinctly arrests the rate of growth. The active body differs from either spermin or lecithin, and seems to come from the interstitial glandular structures of the testicle. The writers ascribe considerable therapeutic importance to their work, as they find in the case of certain children, who, before the full development of their ovaries or testicles, commence to grow very rapidly and outgrow their strength, the injection of orchitic fluid slows the rate of growth. In several cases observed by the authors, excellent results were obtained.

Anti-tuberculous Serum of Marmorek.

In the *Berl. klin. Wchnschr.* for 22nd January, two papers appear dealing with the use of this serum. In the first paper, Stadelmann and Benfey record their experience with five cases. The results were so discouraging that the use of the serum was soon stopped. In no case was there any improvement either in the local condition of the lung or in the general health. The serum, in fact, appeared to do more harm than good. The injections were often followed by febrile attacks, and in many instances, despite all care, local disturbance in the site of injection resulted, *e.g.*, urticaria, redness, and painful infiltrations, with swelling of lymphatic glands. The serum employed was obtained from Marmorek, and was used according to his instructions.

In the second paper, Levin summarises the results obtained from the use of the serum in Sweden, Norway, and Finland. He records the result of a large number of experiments in animals, which show that the serum is not capable of preventing the growth of tubercle completely, but at the same time it distinctly hinders the rate of growth. Clinically, he has been able to collect 155 cases in which the serum was used. The cases were treated partly in sanatoria, and partly as private patients. In the earlier days of the serum the injections were given for six successive days, followed by a pause of fifteen days, when a new cycle was commenced. The individual dose in each case is 5 c.c., injected in the subcutaneous tissue of the abdomen. Latterly this procedure was slightly modified. The injections were given every second day till ten or twelve had been administered, when they were stopped for one month, and then recommenced. As a rule, at least two of the latter series were required before a distinct action was produced. Unfortunately, it is not yet possible to say if the improvement obtained is permanent. In fifty-three of the cases the serum injection caused unpleasant side actions, joint pain, rash, fever, etc., without, however, necessitating the interruption of the treatment. In eleven cases there was collapse and more serious disturbance. In eighty-three of the cases, *i.e.* upwards of 50 per cent., no definite serum complication was observed. For purposes of exact comparison, the cases are divided into those which received at least seventeen injections, and those which were insufficiently treated with less than this number of injections. The former class consist of sixty-one cases, of which seven represented Turban's first stage, thirty the second stage, and twenty-four the third stage. The results of the treatment on the subjective symptoms are shown by the following table :—

Subjective Alteration.

	Increased.	Unchanged.	Diminished.
Strength . .	Forty-one cases = 67 per cent.	Fourteen cases = 23 per cent.	Six cases = 10 per cent.
Appetite . .	Twenty-three cases = 38 per cent.	Thirty-five cases = 57 per cent.	Three cases = 5 per cent.

Shortness of breath was not felt in eleven of the cases. In the remainder, in twenty-five cases = 50 per cent. it disappeared ; twenty cases = 40 per cent. remained unchanged ; in twenty-five cases = 10 per cent. it increased. Thus we see that the three chief subjective symptoms are materially improved by the use of the serum.

Objective Alteration.

	Improved.	Unchanged.	Worse.
Percussion . .	Thirteen cases = 22 per cent.	Forty-six cases = 69 per cent.	Two cases = 3 per cent.
Auscultation .	Thirty-four cases = 56 per cent.	Twenty-one cases = 34 per cent.	Six cases = 10 per cent.

Fever was not present in thirty-one of the cases, but in the other thirty under the serum it diminished in seventeen = 57 per cent., remained unchanged in seven = 12 per cent., and increased or appeared for the first time in ten cases = 33 per cent.

	Increased.	Unchanged.	Diminished.
Body weight .	Thirty-seven cases = 64 per cent.	Seven cases = 12 per cent.	Fourteen cases = 24 per cent.
Sputum . .	Eight cases = 15 per cent.	Seventeen cases = 33 per cent.	Twenty-seven cases = 52 per cent.
Bacilli (thirty-three cases)	One case = 3 per cent.	Twenty-three cases = 70 per cent.	Nine cases = 27 per per cent.

This must be considered a very favourable result, as the majority of the cases were distinctly improved, despite the fact that they represented fairly advanced stages of the disease. Dr. Walter of Halahult, whose experience is based on twenty-six cases treated with Marmorek serum, states that the serum exerts a definite curative action. He employed it almost entirely for advanced cases, as 77 per cent. of his cases were in the third stage, and several of them showed the diazo reaction. He finds that, despite the unpleasant nature of the serum reaction, the patients desire the continuance of the injection, as they find that their shortness of breath is diminished; the dry, hacking cough disappears, and the sputum comes up much more easily.

INSANITY.

UNDER THE CHARGE OF

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SPECIAL WARDS FOR MENTALLY AFFECTED PATIENTS FROM OTHER HOSPITALS.

AN interesting new departure has recently been made in the Hôtel Dieu, Paris, which has been described by Dr. Ballet (*Presse méd.*, Paris, 1905, July 15). In this large hospital, at the suggestion of Dr. Ballet, and with the co-operation of his colleagues, the Director of Public Assistance has set aside and equipped two wards of seven beds each for the reception and treatment of mentally affected patients from the other wards of the hospital. When there is vacant accommodation, similar patients from other hospitals are also admitted. The staff consists of one female and two male nurses for the male ward, and one male and two female nurses for the female ward. There is both a day and a night staff of this number. The question of having a staff entirely female was considered, but not, in the meantime, entertained. The wards are not all that could be desired, and there is a prospect of more suitable ones being provided, but the present have proved of very great service. They were opened in November 1904, and Dr. Ballet in his lecture gives an account of his experience of them for two and a half months. During that period fifty men and twenty-eight women were under treatment. Twenty of these were cases of pure alcoholic delirium or of alcoholism complicated by pneumonia or tuberculosis. A full table is given of all the cases treated, with the disease from which they suffered. Seven were admitted on account of hysterical delirium, six with general paralysis, and six with brain softening. In a footnote it is stated that in seven and a half months 158 patients had been treated. The wards serve a twofold purpose: the removal of noisy and troublesome patients from the general wards of the hospital, and the study of incipient or doubtful cases of insanity. Experience has shown that these purposes have both been satisfactorily fulfilled. When the patient recovers from his mental disturbance, he is returned to the hospital from which he was sent if not completely cured of the disease which caused the delirium. If this too is cured he is discharged at once. If the mental disturbance is prolonged or the patient turns out to be certifiably insane, he is sent to an asylum.

This is a new departure on which those responsible for the management of the Hôtel Dieu may be congratulated. It has already worked well in a number of hospitals in this country, where it has been in existence for some time, and it is not too much to say that every large hospital should have similar provision made. It is to be hoped that the example of the Hôtel Dieu will be followed in other parts of France.

Statistics of Hereditary Insanity.

In the *Wien. klin. Wchnschr.* for January 4, 1906, Professor Wagner v. Jauregg draws attention to an important and instructive paper by Dieni of Zurich on "Statistics of Heredity in Insanity" (*Arch. f. Rassen u. Gesellsch. Biol.*, Berlin, 1905, March–April). It is on similar lines to one published by Koller three years earlier, and confirms the results there stated. The importance of these papers is based on the fact that they include investigations into the heredity of families representative of the ordinary population, as well as of that of patients in asylums. Some of the conclusions reached are as instructive as they are unexpected. In the article above cited, the heredity of the same number of sane and insane individuals was investigated. This number was 1193. In the case of the mentally sound individuals the extent to which hereditary taint prevailed reached the surprisingly high figure of 67 per cent. In the mentally unsound the figure was 77. The weight to be attached to heredity in the causation of mental disease appears therefore to be only 10 per cent. It is important to know the basis of Dieni's inquiry, especially with respect to the degrees of relationship included in the investigation, and also what is embraced by the term taint. These are unfortunately not definitely enumerated in Professor Jauregg's paper. There are, however, certain interesting comparisons given. Direct heredity occurs twice as often in the mentally unsound as in the sound. As regards indirect or collateral heredity, the figures are almost exactly reversed. Direct and indirect heredity of mental disease occurs four times oftener in the insane individuals. Direct heredity of insanity occurs eight times oftener. Nervous diseases and apoplexy occur much more often in the healthy than in the insane families. Many other most interesting comparisons are made.

We are indebted to this paper for a further important suggestion. Predisposition has as its complement immunity. Is there any statistical evidence of this with respect to insanity? Apparently there is, especially if further and more extended inquiry should confirm Dieni's figures. As stated above, outside the direct line of inheritance, related disease is present to a much greater degree in the mentally sound than in the unsound. In the case of uncles and aunts alone, the proportion is about 5 to 2. With grandparents alone it is as 3 to 1. In other words, a taint present in uncles, aunts, or grandparents appears to confer a decided degree of immunity as regards the occurrence of mental disease. If the taint referred to takes the form of nervous disease, this immunity is still further augmented. Even such a disease as senile dementia appears to confer a quite appreciable immunity. Statistics of other interesting and important relations given in the paper will well repay careful perusal. This is almost the first attempt made to gain reliable statistics of the relatives of mentally sound individuals to compare with similar ones for the mentally unsound, and the novel and unexpected character of some of the conclusions obtained should lead to further vigorous prosecution of the same line of inquiry.

INDIVIDUALITY AND MENTAL DISEASE.

AT the meeting of German Naturalists and Physicians held last September at Meran, Dr. Clemens Neisser read an instructive paper on "Individuality and Mental Disease" (*Berl. klin. Wchnschr.*, 1905, Nos. 45, 46, and 47). Tiling has already advanced the idea that mental disease may be defined as an unusual modification of normal mental life, and that therefore psychiatry is only a branch of psychology. Neisser strongly controverts this view for various reasons. It is, he maintains, impossible to predict what the psychological results will be when normal stimuli are changed. The extent of skin surface to which the same thermal stimulus is applied introduces an entirely new element, and what was previously pleasant or indifferent now becomes painful, the area of stimulation being greater. Further, there are manifestations in mental disease which have no parallel in normal existence, *e.g.* a patient hears his own thoughts repeated by a voice in the wall of his room. In other cases judgment proceeds upon wrong lines, and a quite erroneous conclusion is reached by its exercise. Quite new psychological phenomena may therefore be exhibited as a consequence of disease or diseased processes. This consideration rules out all degenerates, all cases of acute delirium, and all those in which there is gross nervous disease. In all these the personality is no longer intact. It is diseased and abnormal. Further, a careful study of the symptoms in melancholia and mania does not, in the author's opinion, lend any support to the idea that there is a close relationship of the personality to these symptoms. In paranoia the relationship is more apparent, but even here it is not always easy, and sometimes impossible, to discover.

INVESTIGATION INTO THE ETIOLOGY OF GENERAL PARALYSIS OF THE INSANE.

DR. J. D. O'BRIEN of Ohio has recently published (*Am. Med.*, Phila., 1905, September 23) the results of his investigations into the etiology of general paralysis of the insane. These were along the lines suggested by the work of Drs. Ford Robertson and Bruce, who have endeavoured to show that this disease is dependent to a large extent on a bacterial toxæmia. O'Brien reports that in eleven out of fourteen general paralytics he has isolated a diphtheroid bacillus from the stomach contents. He also obtained the same organism in the urine of seven out of ten cases, in ten out of twelve cases from the nose and throat, and in two cases examined post-mortem the organism was obtained in both from culture of the cerebral ventricular fluid. In three out of six cases it was found in brain sections. He also made experiments in feeding animals with the organism, but his results were not conclusive. He is therefore continuing them. This work is, so far as it goes, a confirmation of investigations in the same direction referred to above, and it is to be hoped they will tend to gain a still wider hearing for this most important suggestion as to the causation of general paralysis.

THE DEGENERATE EAR.

VOROBIEFF has a short paper in the *Journ. Ment. Path.*, N.Y., 1905, No. 2, p. 57, on the degenerate ear, giving a summary of his larger and more detailed work, "The External Ear of Man," Moscow, 1901. His opinions are based on an examination of 325 normal persons belonging to Moscow and its neighbourhood, and of 100 insane patients born in the same district. His conclusions are contained in the following summary:—(1) The majority of statistical data regarding the degenerate ear are founded on numerous and major errors of method. (2) The measurements of the ears do not differ materially in normal and insane subjects respectively. It may be added, nevertheless, that in the insane and degenerate the general tonicity of the ear-shell is relaxed, giving the ear somewhat exaggerated dimensions in length and in breadth. (3) The embryonic types of the ear are markedly prevalent among normal subjects. Among the insane and degenerate these forms prevail either to the same extent as among normal subjects, or, if the proportion is somewhat higher, the difference is too small to be of any significance. (4) The standing-out ear, on the contrary, is of significant meaning; although it may be found among normal subjects now and then, it is met with to a marked degree among the degenerate. It must be supposed, however, that in this case the structure of the ear alone is responsible for its characteristics; the structure of the skull may also contribute to its peculiar attitude. (5) There are peculiarities of the ear structure that are seldom found among normal subjects. They are in no way characteristic, and cannot be generalised as to their configuration. In a word—they are true anomalies.

DERMATOLOGY.

UNDER THE CHARGE OF

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The So-called Blastomycosis of the Skin.

Under the term "Blastomycotic Dermatitis," a series of over forty cases have been published, which may be divided into two groups. The larger one, so far almost limited in distribution to the American continent, includes cases of a neoplastic and chronic affection, assuming peculiar verrucose features, resembling, in fact, very closely tuberculosis verrucosa cutis, and seldom fatal. These may be entitled cases corresponding to the Gilchrist type, from its earliest observer. The smaller is seen on this side of the Atlantic, seems much more rare, and is composed of cases exhibiting tumours, rapidly passing into burrowing ulcers, and ending in death. These may be named those of Buschke's type, as he has related a characteristic instance. Krause (*Monatsh. f. prakt. Dermat.*, Hamburg, 1905, August, September, October, December) has made an elaborate study of these, and has arrived at very definite conclusions. He was led to this by the occurrence of an example in

Unna's clinic, which agreed to the description of the American cases. In Buschke's instance the early appearances were like acne, with eventual central necrosis, out of which crateriform ulcers developed, which grew in width, as also in depth, reaching even to the subcutaneous tissue. These by extension merged into a tolerably large loss of substance, having undermined, elevated, only slightly infiltrated, livid margins. The granular floor was extremely painful and sensitive, the edges less so. These ulcers secreted a tough, thready, tolerably transparent fluid, at times grey in colour, at others brownish-red and grumous. In the ulcers yeast fungi were found in immense numbers, and two months before death were cultivated from the blood. The Gilchrist type is also a chronic affection, springing originally from a papule, advancing serpiginously with central repair, and having a surface considerably raised above the surrounding tissue, but peculiar as being invested with papillary excrescences, interspersed with bands of soft cicatricial substance. There were found numerous miliary abscesses, mostly situated deep in the rete, but some likewise superficial. The abscesses contained many polynuclear leucocytes, fragments of nuclei, epithelial particles, red blood corpuscles, and giant cells, within and outside which were the "organisms." The "organisms" from various examples showed great differences, and, inoculated on special media, displayed marked polymorphism. A tabular scheme shows that mould fungi predominated, oidium and staphylococci were encountered, seldom yeast organisms. In the tissues they were seen as round, or oval, highly refractive minute bodies, included in a homogeneous capsule with double contour. They had protoplasmic contents, sometimes finely, sometimes coarsely granular, often separated from the capsule by a clear zone of varying thickness. Some showed vacuoles or transparent spore-like particles. In Unna's case all attempts at producing yeast organisms by cultivation failed; only a special variety of a yellow staphylococcus constantly recurred. Krause does not regard the microbes obtained by cultivation in the American cases as yeast organisms. He ends by stating that while the disease Buschke has described is blastomycosis, *κατ' ἐξοχήν*, this term ought not in future to be regarded as applicable to the Gilchrist type. Another very widespread case of the Buschke type has been recorded by Fabry and Kirsch (*Arch. f. Dermat. u. Syph.*, Vienna, 1905, Bd. lxxvii.). Yeast organisms were found abundantly in depressions in the skin in close relation to the ducts of the pilo-sebaceous glands, and also, but sparingly, in the cutis. Efforts at cultivation were unsuccessful. Though not fully proved, they are inclined to regard the organisms as closely connected with the origin of this peculiar disease.

AN ATROPHIC FORM OF LUPUS ERYTHEMATOSUS IN PATCHES.

THIBIERGE (*Ann. de dermat. et de syph.*, Paris, 1905, December) has collected a series of anomalous cases, which he has grouped under the above term. Commencing as a red papule, or more frequently as a red blotch, without any subjective disturbance or modification of sensibility, without, indeed, apparent cause, patches arise whose chief character is to be below the level of the adjacent skin, exactly bounded by the framework of the sound integument, which commonly presents no modification either of aspect or colour. The patches are shining and glossy; the uniformity of their surface is hardly broken by existing follicular orifices, often shrunken, and lanugo hairs. The epidermis is sometimes a little folded. The colour varies according to the duration of the disease and the situation of the patch. It is a more or less vivid red at first, subsequently becoming rather livid, and ending by assuming a faintly bluish tint, reminding one of the tint of tendons. The redness, when present, disappears completely on pressure, without leaving any perceptible stain. The redness may last a considerable time, either over the entire patch, or only on the more recent parts, namely, the periphery. Even when it has vanished, simple exertion can reproduce it. Neither vascular dilatations nor telangiectases are discoverable. The consistence of the lesions may be less than that of normal skin, or it may be denser. There is, however, a loss of elasticity, since the skin bends more easily than is natural, and recovers its shape more slowly. Hence the name, anetodermia (ἄνετος, soft), proposed by Jadassohn. The patches are fairly rounded or oval; they are distributed symmetrically, or at least develop on corresponding parts, though differing perhaps in individual dimensions. Their progress is almost constantly progressive, spreading centrifugally, in one instance still advancing even after sixteen years. The regions attacked vary. In the most typical instances the face is the seat; in the form of multiple foci it may occur on the scalp, but it rarely invades the limbs or the trunk. This variety of atrophy has been diversely interpreted by different observers. It has been considered as idiopathic, independent of any other morbid condition. From a consideration of all the circumstances, Thibierge holds the opinion that it is a form of lupus erythematosus, in which the epidermic and glandular lesions are reduced to a minimum, and where the alterations, affecting almost exclusively the derma, lead, apart from any marked inflammatory reaction to cutaneous atrophy, and especially to the atrophy of the elastic elements of the skin. As bearing on the etiology in nearly all cases, tuberculous lesions are found in an active state. The majority of the examples recorded have been in women, and lupus erythematosus is notoriously most frequent in that sex.

The Treatment of Lupus Vulgaris.

While the newer methods by light and the X-rays have enormously extended our power over this disfiguring disease, these have not wholly superseded the simpler and less costly. Werther contributes an excellent résumé of those available in districts apart from towns (*Berl. Klinik.*, 1906, January). In selecting a mode of treatment, he observes that an essential element is the expense, since lupus vulgaris is notoriously an ailment of the poor. The cure occupies a long time, and we have to reckon with many relapses. Thus many patients recoil from such methods as are in themselves costly, or which will interfere with the pursuit of their ordinary occupations. The aim of the physician is to obtain a radical cure with as little disfigurement as possible. This will be the more readily attained the smaller the area and the earlier the nature of the complaint is recognised. Everyone, therefore, should familiarise himself with the characters of lupus in all its various clinical forms. Lupus often commences in the interior of the nose, frequently beginning in the lachrymal duct or canal, a situation difficult of access, and thus a source of recurrence. From the variety of the clinical forms, diverse requirements in the management are demanded. A dry lupus is nearer being well than an ulcerated one, and the level than the elevated types. Conceptions of cure, too, are subject to disparities. An apparent is often mistaken for a real recovery. To the practised eye many remaining nodules are discoverable in a white smooth scar, certain later to originate recrudescences. Again, while there may be a surface cure, nodules may lurk in the fatty layer or in the neighbourhood of the sweat glands, which have not been reached, and which, in proportion as they grow, approximate more and more nearly to the free surface of the skin. Treatment, therefore, must be both wide and deep. Apparently unaware of M'Call Anderson's lately published results, he condemns the old tuberculin as very rarely reliable, and the new as still more uncertain; still, as it has fewer disadvantages than the old, its aid may be invoked in cases where the disease is difficult of access. Vidal's original procedure by often-repeated and persistent scarifications is strongly endorsed. In deeply infiltrated but not ulcerated areas one can combine beneficially the application of permanganate of potassium with scarification. Once a week the patch is scarified, then daily for a quarter of an hour compresses of a 2 per cent. solution of permanganate are applied under an impervious dressing, while any resulting irritation is treated in the interval with zinc paste. The patch gets much firmer, and in four to six weeks much progress has been made. Resorcin, again, is a useful remedy. It may be prescribed as ℞ Resorcin, 30·0; lanolini, 40·0; vaselini, 20·0. Or, in milder form, ℞ Resorcin, 30·0; zinci oxidi, amyli, āā 20·0. These ointments are spread on linen, bandaged closely down, and changed night and morning. After twelve hours the lupus shows a greyish-white layer on the surface; this is rubbed off with a pledget of cotton-wool, and the salve continued for eight or ten days. Then for some days compresses of solution of acetate of alumina or boric acid are suitable; then the salve resumed for another period, and persisted in for months. In lupus of the mucous membranes, as the gums, iodine is useful. ℞ Iodi puri, 1·0; potassii iodidi, 2·0; aq. dest., 2·0. This, after cocainising, is sopped on daily after meals. Also iothion, used in the same way. ℞ Iothion, 15·0; sp. vini, glycerini, āā 7·5. The lupus patient must be warned that recurrences are frequent, and must be watched for. To test if cure is complete, an injection of the old tuberculin is to be administered. Should no local reaction appear where previously it was well marked, one may venture to pronounce the case cured.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

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Etiology and Dietetic Treatment of Infantile Atrophy.

Wentworth (*Journ. Am. Med. Assoc.*, 1905, August 25). While it is generally believed that infantile atrophy owes its origin to a combination of dietetic errors, the exact manner in which faulty diet produces the condition is still unknown.

Nothnagel, and following him Baginsky, assumed that a constant derangement of digestion caused atrophy of the intestines, interfering with absorption, and thus bringing about general wasting of the tissues of the body. In support of his view, Baginsky produced drawings illustrative of the microscopic appearances of the intestines in such cases. Heubner, Gerlach, and Bloch (*Jahrb. f. Kinderh.*, Leipzig, 1901, Bd. liii.) have disputed the correctness of these findings, and claim that the microscopic appearances described by Baginsky are due to post-mortem changes. Bloch has recently published the results obtained by him from the examination of three cases of infantile atrophy (*Jahrb. f. Kinderh.*, Leipzig, 1904, Bd. lix.). Post-mortem changes were avoided by injecting a quantity of a 10 per cent. solution of formalin into the peritoneal cavity immediately after death, and in none of the cases was there any appearance of intestinal atrophy. The only abnormality to which he attached any importance was the condition of Paneth's cells, which are found in Lieberkuhn's ducts. These cells did not contain the granules which are supposed to be evidence of their functional activity. Bloch attaches great importance to the condition of these cells as a causative factor in the production of atrophy, and he maintains that their condition is a primary one, and is not induced by the atrophy. In describing the liver changes, Bloch says that in no case did he find any inflammation or cirrhotic appearance. On the whole, therefore, it may be said that there is no convincing evidence of any constant gross or microscopical changes in the intestines or liver in infantile atrophy beyond the possible absence of Paneth's granules.

The strongest argument against the theory of intestinal atrophy is furnished by the rapidity with which the infant gains weight when a suitable food is given, exceeding the average gain made by a normal healthy infant. It is inconceivable that repair of a serious structural lesion could occur so completely or so rapidly. It is probable that impaired intestinal functions and absorption are of chief importance in the production of the atrophic conditions in the infant.

The assumption that chronic intestinal intoxication caused infantile atrophy has not up to the present time been satisfactorily demonstrated. In 1897, Czerny stated his belief that an excess of cow's milk proteid in the diet might produce an acid intoxication, which would impair the function of the liver (*Jahrb. f. Kinderh.*, Leipzig, 1897, Bd. xiv.). In this belief he was supported by Keller and Van den Bergh. Pfaundler, however, disproved this theory, and came to the conclusion that a physiological hyperacidity is present in artificially fed infants whose food contains an excess of fats. His experiments on the amount of ammonia in the urine went to show that there was not an acid intoxication. The feeding with breast milk restores the function very quickly, and possibly there are ferments in breast milk which stimulate digestion (*Jahrb. f. Kinderh.*, Leipzig, 1901, Bd. liv.). Three methods of feeding atrophic infants are discussed, namely, proprietary foods, cow's milk mixtures, and breast milk. In the majority of cases proprietary foods are unsuitable, though it cannot be denied that some cases of atrophy gain rapidly in weight and seem to thrive on these foods. These good results, however, are of little assistance to the physician as guides to treatment in similar cases, as they follow no definite rule, and often instead of proving serviceable are the cause of rickets and scurvy.

Cow's milk mixtures are better, but they, too, are usually unsuitable. Heubner says that, in cases of atrophic infants more energy is expended in the act of digestion, and that it requires more calories per kilo. weight than in a normal infant in order to balance the extra energy lost in the intestines and absorbents during digestion. It is generally considered that cases of infantile atrophy digest and gain more on cow's milk mixtures when the percentages of fat and of proteid are low. This deficiency must to some extent be made up by increasing the carbohydrates, otherwise there is greater danger that the mixture will contain too little nourishment for the infant's needs. The fact that these infants absorb carbohydrates better than they do fats and proteids, probably explains the rapid improvement that sometimes follows the use of condensed milk and proprietary foods. It has been shown that a relatively small quantity of proteid is required to repair tissue waste as long as this small quantity is protected by a sufficient quantity of fat and carbohydrates. Metabolism observations seem to show that these infants possess the power of retaining proteid to a greater degree even than the average infant. Heubner points out that excessive quantities of proteid are therefore detrimental to these infants, as they require so much energy for their utilisation. A majority of the cases of atrophy that recover on cow's milk mixtures do so on relatively small quantities of a mixture weak in fat and proteid. The interval between each feeding in these instances should be shorter than for a normal infant of the same age.

Human breast milk is by far the best and most reliable food. In many cases even a few weeks of breast milk will produce such improvement in the weight, general condition, and digestive power of the infant, that it will be able to adapt itself to cow's milk mixtures if, for any reason, it becomes necessary or desirable to make a change.

A New Symptom of Tetany in Children—The Tetany Face.

Uffenheimer gives several illustrations of children to show the peculiar expression illustrative of tetany. It may be observed even before any other signs are manifest. The muscles of the face seem to feel the influence of the impending tetany, and the face assumes an expression which is the first faint suggestion of the risus sardonicus of true tetany. He has observed more than fifty cases, his attention being attracted to the children by this tetany face. In every case the application of electricity and later events confirmed his diagnosis. Differentiation at this early stage allowed prompt treatment to be employed, and cured many of the children without the development of further symptoms of tetany, the Chvostek and Trousseau signs subsiding as the children's expression returned to normal. The muscles affected are those supplied by the facial nerve. The face is drawn up and wrinkled like that of a harassed adult, and assumes a worried and morose expression.—*Jahrb. f. Kinderh.*, Leipzig, Bd. xlv. S. 1270.

Infantile Paralysis of Abdominal Muscles.

In describing the muscular involvement in cases of infantile paralysis, it is seldom that the condition of the abdominal muscles is referred to, and the general conclusion seems to be that paralysis of the abdominal muscles is exceedingly rare. In the frequently widespread paralysis at the onset of this condition, it is possible that many cases showing participation of the abdominal muscles are overlooked, and as the tendency in the vast majority of cases is to rapid recovery, the initial paralysis of these muscles is possibly unnoticed. Seeligmüller in his series of seventy-five cases did not have a single case of either back or abdominal muscle paralysis. In 340 cases described by Sinkler, in twenty-two of which there was involvement of the trunk muscles, in none were the abdominal muscles affected. Duchenne, Birdsall, Bernheim, and Leiner each describe one case. The following is the only case of residual paralysis of the abdominal muscles reported from the Johns Hopkins Hospital. The case is further interesting as presenting the crossed type of paralysis of the extremities. After an attack of fever lasting three days, in a child æt. 21 months, it was noticed that he could neither sit nor stand, and afterwards it was discovered that the right leg and left arm were paralysed. In about a month movement had returned to both these paralysed extremities, and the child could walk and use her arm fairly well. In the abdomen from the commencement of the illness there was asymmetry, which gradually became more apparent as the muscles became more flaccid and atrophic. In dorsal decubitus the abdomen was full, but more prominent on the right side. When the child cried and raised the intra-abdominal pressure, the right side ballooned out very markedly; on palpation the muscles on the left side contracted under the hand, but not on the right side. In the erect position the conditions were intensified. The asymmetry was much more prominent in this position, and the right side bulged out to the full limit of the flaccid and paralysed abdominal wall. Skin reflex was present on the left but absent on the right side of the abdomen. The paralysed muscles were the oblique, the tranversalis, and half of the rectus abdominis on the right side. There was no lordosis present, but a slight scoliosis in the lumbar region, with a convexity to the right.—*Johns Hopkins Hosp. Bull.*, Baltimore, 1906, January.

Hypertrophy of the Pylorus in Infants, and its Medical Treatment.

The medical treatment of hypertrophy of the pylorus consists in—(1) Removing all possible sources of irritation to the stomach by lessening the bulk of the meals and administering nourishment that will contain as little solid residue as possible. (2) Soothing the stomach by stomach washing, sometimes by gavage, by the application of hot poultices to the abdomen, and by the administration of sedatives. (3) Easing the patient's thirst by means of rectal and subcutaneous normal saline injections. There can be little doubt that medical treatment should always be given a careful trial before surgical proceedings are thought of. Some improvement can practically always be effected by it; and even if it fail to cure the child it will probably get him into a better state to stand the operation. On the other hand, it is to be remembered that only the closest study of the case can justify our delaying operative interference. While the child is gaining in strength and weight it is certainly wise to defer surgical measures. Should he begin to go down-hill or even to remain stationary for some considerable time, he should be operated on without delay.—*Pediatrics*, 1906, January, p. 47.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Medico-Chirurgical Society.—*March* 7, 1906.—Dr. J. O. Affleck, President, in the chair.—Specimens were shown by Dr. Edwin Bramwell.—Dr. T. C. Mackenzie showed a case suggestive of general paralysis.—Dr. Edwin Bramwell showed—(1) Two cases of non-progressive hemiplegia, in both of which an intracranial tumour was diagnosed as the probable lesion; (2) a case of syringomyelia, with scapulo-humeral arthropathy.—Dr. R. A. Lundie read a paper on a case of transient blindness, due to spasm of the retinal artery. The patient was a man æt. 88, who suddenly and completely lost vision in one eye. The eye was examined soon after the attack, and it was observed that part of the retinal artery was quite empty. The spasm gradually passed off, and the vessel resumed its normal appearance, vision being completely restored. The attack, in all, lasted about an hour. These cases are usually ascribed to embolism or thrombosis. No satisfactory cause has been found for the condition. In some cases the spasm may last too long for the retina to recover, and vision is thus permanently impaired. Dr. Lundie suggested that certain obscure cases of transient loss of brain power and transient neuralgias may be due to local spasm of arteries.—Dr. H. M. W. Gray of Aberdeen read a paper entitled "Vaccine Treatment in Surgery," which was the work of himself and his colleague, Dr. G. M. Duncan. Vaccine treatment means the injection of the organisms (dead) that cause the disease. After injection a negative phase occurs. This is followed at a varying interval by a positive phase, during which another dose may be given. It is dangerous to administer the vaccine during the negative phase. The duration of the negative phase is ascertained by the opsonic index. It lasts on an average about ten to fourteen days. Dr. Gray finds the local reaction a sufficient guide in the majority of cases, and consequently does not use the opsonic index to any great extent, thus saving much time. The cases treated were mainly tubercular, the vaccine used being tuberculin R. In several cases of tuberculous glands and joints the necessity for surgical treatment was obviated, a cure being obtained by the vaccine treatment alone. In others the surgical treatment was rendered much less drastic, and the healing power improved by one or two doses given before operation. In cases of mixed infection, the use of staphylococcus or streptococcus vaccine along with the tuberculin R. was found of great service. It apparently makes no difference whether these be given together or separately. The earlier the vaccine treatment is begun the better is the result. The treatment should not be persisted in if there is no improvement after, say, three injections. The case should then be treated surgically. The convalescence is shortened by the vaccine injections. Intramuscular injection is best, and the usual dose is $\frac{1}{900}$ mgrms.—Dr. J. C. Dunlop read a paper entitled "Occupation Mortalities in Scotland," which will appear in the Journal.

EDINBURGH OBSTETRICAL SOCIETY.—*March* 14, 1906.—Dr. J. W. BALLANTYNE, President, in the chair.—Dr. HAIG FERGUSON read a paper on "Abdominal Hysterectomy for Acute Puerperal Metritis (Multiple Abscesses in Uterine Wall) and Acute Salpingitis," with record of a successful case, which appears in this number of the Journal.—Dr. HAULTAIN read a paper on "A Clinical Experience of Ectopic Pregnancy and Allied Conditions." He discussed the relative frequency and importance of the various symptoms of ectopic gestation, and considered the source and character of the bleeding into the peritoneum and into the uterus. Dr. Haultain believed that in some cases the hæmorrhage which escaped from the uterus came from the Fallopian tube. The expulsion of the decidual cast was the least frequent symptom in his experience. He described the difficulties met with in differential diagnosis, and reported illustrative cases. Finally, Dr. Haultain insisted on the importance of immediate operation in all cases.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*March* 12, 1906. —The President, Professor MUIR in the chair.—Dr. JAMES A. ADAMS showed a patient from whom he removed a supernumerary lobe of the liver. The patient was a man, æt. 28, who had suffered, intermittently, for some years from pain in the stomach region, attacks of vomiting, hæmatemesis on three or four occasions, and, latterly, symptoms of pyloric obstruction. At the operation a pedunculated accessory lobe of the liver arising from its under-surface to the left of the gall bladder was found, which pressed on the pylorus, and was believed to occasion the symptoms. This lobe was removed, and the patient made an excellent recovery, and the symptoms from which he suffered have greatly improved.—Dr. JAMES FINLAYSON gave a short account of a well-marked case of Addison's disease, and the President, Professor Muir, described the conditions met with at the autopsy, and demonstrated the specimens from the case.—Dr. A. N. M'GREGOR read a preliminary note on a rational operation for the radical cure of inguinal hernia.—Dr. JOHN W. FINDLAY read notes of two cases of chronic lymphatic leukæmia, both of which presented similar characters as regards duration of disease, general enlargement of the lymphatic glands, enlarged spleen, and the occurrence of a medium-sized lymphocyte in the organs. Microscopical sections were demonstrated by Dr. Leonard Findlay.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.—*March* 16, 1906.—Dr. JOHN M. COWAN gave a lantern demonstration illustrating the results of the infections upon the arteries; and Dr. LINDSAY STEVEN discussed some of the clinical aspects of arterial disease.

FORFARSHIRE MEDICAL ASSOCIATION.—*March* 8, 1906.—Dr. LENNOX, Vice-President, in the chair.—Dr. M'GILLIVRAY presented several cases. The first was that of a man with chronic senile ectropion. The second was that of a young girl who suffered from a very high degree of myopia − 16 D. The lens had been removed from the left eye, with satisfactory result, and the right eye would be treated in a like manner. The third case was one of neglected iritis. There were complete annular synechiæ with secondary glaucoma. An iridectomy was done, and relief obtained. The fourth case was a boy who received a blow on the left orbit, which produced homonymous diplopia, caused by paralysis of the superior oblique muscle. He then described a severe case of gonorrheal ophthalmia in a young woman, with considerable corneal ulceration, which had been successfully treated by applications of 25 per cent. solution of argyrol every two hours.—Dr. H. Buist showed a case of elephantiasis of the leg in a woman, æt. 24.—Dr. G. Pirie showed a case of lupus, successfully treated by X-rays during a period of six months.—Professor MacEwan exhibited specimens obtained from a patient sent into hospital with intestinal obstruction, but who died from collapse following perforation of the bowel before an operation could be attempted. On post-mortem examination, the large intestine was found to be studded with small adenomatous growths. There was a large adenoma at the hepatic flexure, causing complete obstruction, and not far from this was a small perforation. A large tumour, the size of the fœtal head, was found in the right suprarenal gland, which, on examination, appeared to be of a sarcomatous nature.—Dr. Foggie read notes of a case of congenital dextro-cardia which he had had under observation since birth, and on which he had obtained a post-mortem examination. The child, who lived to the age of 2 years and 10 months, had sprung from a stock prone to rheumatic and cardiac affections. In addition to the displacement, there was a loud systolic murmur, and also latterly a diastolic. The growth and general appearance was that of one subject to congenital heart disease. The autopsy showed a heart on the right side. The other organs were not transposed. There was a common auricle, and the interventricular septum was defective. The pulmonary and aortic valves were normal, but the tricuspid and mitral were markedly incompetent. The ventricular walls were thickened, and showed fatty degeneration of their substance.—Dr. Don read notes on the diagnostic value of radiography in tuberculous disease of bone. The effects of tuberculosis in bone were first discussed as regards new osteophytic formations, softening, and cavitation; radiograms of each stage were shown, and their value in establishing or confirming a diagnosis brought out. The value of such a radiogram to a surgeon in determining his line of treatment or in planning the extent of his operation was explained; in the case of abscess cavities of obscure origin the radiogram would, in all probability, show the origin of the disease. The method of examining the negatives by means of a view case to bring out details, and the value of a stereoscopic screen, were explained.

ANALYTICAL REPORTS.

ANTHRASOL.

(Knoll & Co., 27A St. Mary-at-Hill, London, E.C.)

THE value of tar in the treatment of various chronic affections of the skin has long been recognised. The great drawback has been the dark colour and sticky nature of the ordinary black tar preparations. In anthrasol, however, we possess a tar preparation which in its keratoplastic and anti-pruriginous action surpasses the ordinary tar preparations. In addition to these advantages, it has the property of being a colourless, mobile liquid which does not stain the skin or obstruct the follicles. It has been tried extensively on the Continent with excellent results. In common pruritus it is best applied as a 10 per cent. alcoholic solution. In pruritus ani and lichen ruber stronger preparations (20 to 30 per cent.) may be used. We have used it in the form of a glycerine ointment with much benefit in pruritus ani. It is also supplied in the form of white tar soaps by Messrs. Cook & Co., London, which are a distinct advance on the black coal tar soaps hitherto in use.

CYLLIN THROAT PASTILES.

(Jeyes' Sanitary Compounds Co. Ltd., London.)

PASTILLES for throat medication have hitherto consisted merely of a compound of liquorice with various balsams. In cyllin pastilles we have a valuable addition in the form of a reliable antiseptic cyllin. It has been conclusively proved that cyllin, while it is a powerful bactericide, is non-poisonous, and can therefore be administered internally with perfect safety. The pastilles have a pleasant taste, are not too sweet, and should prove a welcome addition to the list of remedies for the various affections of the throat so common in this country.

CHLOROFORM, ETC.

(Burroughs, Wellcome, & Co., Snow Hill, London, E.C.)

1. *Chloroform.*—The chloroform recently placed on the market by this firm differs from all the other brands of chloroform with which we are acquainted, in having a small quantity of ethyl chloride mixed with it. To this it no doubt owes the rapidity with which partial anæsthesia is induced. We have used it in obstetric cases when partial anæsthesia only was required, and were struck with the great relief it speedily afforded in very small doses. We have no experience of its use in prolonged operations, and are doubtful if for such cases it possesses any advantages over chloroform to which no ethyl chloride has been added. Ethyl chloride is still on its trial as a general anæsthetic, and so far has only been used in minor operations. We would not care to administer so powerful a drug even in diluted form for any of the major operations of surgery.

2. *Compressed Surgical Dressings.*—These dressings are a distinct novelty, and should be of great service on expeditions and under similar conditions where bulky packages of wool, lint, etc., are undesirable. The dressings are compressed, evidently, under hydraulic pressure, and it is remarkable what dimensions the contents of these tiny packages assume when they are opened out. The difficulty, we should imagine, will be how to stow away what is left over.

ETHYL CHLORIDE.

In connection with some recent fatalities during the administration of ethyl chloride, we feel justified in stating that Hedley's "pure" ethyl chloride was not the preparation employed. As is the case in employing chloroform as an anæsthetic, so with ethyl chloride, only the most carefully prepared drug should be employed, and this we believe Hedley's ethyl chloride to be.

SANATOGEN.

(The Sanatogen Company, 83 Upper Thames Street, London, E.C.)

This food preparation, which has now been before the medical profession for several years, belongs to the class of proteid foods. It consists of 95 per cent. of casein, the proteid of milk, and 5 per cent. of glycerophosphate of sodium. By reason of the latter constituent it is claimed to be more than a mere nutrient preparation, and to exert the specific action of organic phosphorus. The practical value of a food substitute like this depends, first, on the possibility of presenting it to the patient in an agreeable form; and, second, on the extent and ease of assimilation. Sanatogen answers both these requirements, for it is both palatable and readily soluble, so that it can be given in almost any convenient medium. Its absorbability has been tested by Vis and Treufel of Freiburg, who find that it is as completely assimilated as an equal quantity of meat. It may thus be used with advantage in all conditions for which a diet rich in albumin, and at the same time non-irritating and readily absorbable, is necessary. Professor Ewald's observations on its value in typhoid afford clinical confirmation of this. The preparation has thus a wide range of utility; we have tried it with satisfactory results as regards gain in weight in malnutrition in young infants, by whom it is readily taken without disturbing the digestion. As to the second aspect of the value of sanatogen—that due to the action of the phosphorus—it is more difficult to speak with certainty, but the balance of probability is in favour of these organic phosphorus combinations exciting a favourable influence on nuclear nutrition and metabolism, and especially on the nervous system and blood. Glycero-phosphoric acid is a derivation of lecithin which Danilewsky showed many years ago to influence favourably the growth of young animals. Clinical reports show that sanatogen has a particularly favourable action in neurasthenia and in various forms of anæmia, as well as in other diseases, and no doubt this is to be ascribed, in part at least, to its phosphorus contents. Sanatogen has high credentials from many writers of undoubted authority and unbiassed judgment.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

Pulmonary Phthisis—a Notable Advance.

The circular letter issued by the Local Government Board on 10th March in regard to the administrative control of pulmonary phthisis by local authorities is certainly the most advanced, and in its effect the most far-reaching, of any official pronouncement which has yet been made in the United Kingdom.

After pointing out what has been done by local authorities in the way of organised effort to check the spread of this disease by the distribution of information, by the disinfection of houses, by the segregation of advanced cases, by the educative control of less advanced cases, and by the special treatment of early cases, the letter in question makes the following statement:—"Generally it may be said that in no locality have the local authority adequately developed the special organisation necessary for the full administrative control of the disease."

While, as we have already said, the present letter is the most advanced pronouncement which has yet been made, it is both from its Medical and Public Health aspects one which is temperate, and the main conclusions can be supported with an overwhelming weight of evidence.

The first paragraph deals with the infectious nature of the disease, and the methods in which the infection is conveyed from one person to another. Having remarked then that the disease is an infectious one, the letter makes the important statement: "Accordingly, the sections of the Public Health Act applicable to other infectious diseases are equally applicable to pulmonary phthisis, and the obligation resting on the local authority to deal with and control infectious disease extends to pulmonary phthisis." Probably the Board have had the best expert legal advice obtainable before making such a definite pronouncement as the foregoing. We believe that the sections of the Public Health Act can be applied to the prevention of phthisis with excellent results, except perhaps in one or two of their minor details. But while this is so, the line of argument which is set out in the Board's letter—*i.e.* because the infection of a disease is capable of being carried directly or indirectly from one person to another, therefore all the sections of the Public Health Act apply—appears to us to be open to doubt and to be capable of misuse and of causing considerable inconvenience and hardship. Section 56 of the Act in question prohibits an infected person exposing himself in any street or public place without taking proper precautions against spreading the disease. If by "proper precautions" is meant the carrying of a pocket spittoon or a destructible handkerchief for collecting the sputum, then not much harm can be done; but it cannot be too frequently pointed out that a large amount of damage is done by phthisical patients when coughing, and it certainly will be difficult to prevent such patients during coughing, or even during loud speaking, from infecting their surroundings.

The paragraphs in the letter pointing out the necessity for efficient disinfection in cases of tuberculosis are excellent and temperate, and must be of great value in the direction of stimulating local authorities to take action in the prevention of this preventible disease; but perhaps the most suggestive part of the letter is that dealing with the duty of the local authority in regard to the isolation and treatment of cases of phthisis. Here clear and concise statements are made as to what can be done in the way of provision of curative hospitals for early cases, of isolation hospitals for advanced cases, and of dispensaries for pulmonary phthisis. It is pointed out that in regard to sanatoria, good results have been obtained at a comparatively small cost in cheaply constructed sanatoria, or by arranging town sanatoria for treatment of patients during the day-time only or during night-time. Attention is drawn to the work which is being carried on at Brighton of admitting patients to a hospital for educative purposes for a few weeks only.

With regard to the notification of pulmonary phthisis, the statement made that "the Board will be prepared to give favourable consideration to any application for their approval, provided they are satisfied that the local authority are in a position and are ready to deal effectively with the cases notified to them," will assist greatly in demonstrating to the general public, and especially to local authorities, that this disease is one which we have been neglecting during recent years. The fact is clearly pointed out, however, that notification by itself has no administrative value. This is what we have always felt. It has been too obvious in many cases that notification in regard to other diseases is more or less valueless in certain districts, because action is not taken on the notification. In any district where curative treatment, disinfection, etc., can be offered to a patient, there can be no possible objection to notification, provided it is early.

The paragraph dealing with "organisation and administration" in which the Board recommend the local authority to employ the various institutions and agencies already existing, is highly necessary, otherwise the expense of the suggestions made by the Board would be unbearable. It points out that the organisation necessary to deal with the subject is so highly specialised as to demand the services of a special sub-committee of the Public Health Committee. Also, it is pointed out that all of these measures directed towards the direct control of pulmonary phthisis must be merely supplemental to the indirect measures, and that the two should go hand in hand.

The Responsibilities of General Practice.

Two cases have recently been decided before the Courts which are of the greatest interest and importance to medical practitioners. One was an action for damages brought by a gentleman and his wife against a doctor who practised in the South of England. The ground of complaint was that the doctors who had attended the lady in her confinement infected her with scarlet fever, as a result of which she suffered from a pelvic abscess and phlegmasia alba dolens.

The doctor had been engaged for the confinement some time previously, and on the day on which the confinement occurred, in fact, immediately before coming to it in response to a telegraphic summons, it was alleged and admitted that he visited a scarlet fever patient. The lady developed scarlet fever three days after her confinement, and some weeks later the other conditions above referred to.

The plaintiff alleged that the doctor had been guilty of negligence in attending a confinement under the circumstances, and attributed not only the scarlet fever but also the other conditions from which the lady suffered to the fault of the defendant. The latter admitted the fact of having visited the patient with scarlet fever, but alleged that he used all the ordinary precautions which a practitioner under such circumstances ought to employ, inasmuch as he went home, changed his coat, washed his hands in antiseptic solution, and walked for half a mile in the open air; and, before he actually examined the lady, again thoroughly washed his hands and arms in antiseptic solutions, using a nail brush, etc.

For the plaintiff, it was suggested that a medical man should not have attended the confinement at all under the circumstances, and that in any case, if he did so, he ought to have taken a bath and changed all his clothes. Several medical men called for the defence pointed out that the profession of a general practitioner would be impracticable if he had to take a bath and change his clothes each time after seeing an infectious case, while some of them, at any rate, would not agree to the suggestion that the pelvic abscess and white leg had any direct connection with the scarlet fever.

In this latter view we entirely agree. Scarlet fever is scarlet fever whether it be in a puerperal woman or any other person, and we know of no good evidence in favour of its having special danger to the former, provided septic infection is not introduced, from without, into the genital tract. The occurrence of scarlet fever in a puerperal woman has too often been used as an excuse for septicæmia caused in the ordinary way.

It is satisfactory to note that Mr. Justice Lawrence took the reasonable and common-sense view in his summing up, that it was impracticable to demand that a general practitioner should take a bath and change all his clothes after seeing every case of infectious disease which occurred in his practice. The jury likewise agreed that the defendant had done all that was to be expected of him under the circumstances.

The second case also relates to the question of what is to be considered the amount of care and skill required of a medical man, the absence of which will render him liable to an action. This case had been twice previously tried in Court, and on the third occasion it came before the Lord Chief Baron and a jury at Belfast. The essential fact involved was that the medical practitioner prescribed Belladonna liniment without duly warning those who were nursing the patient of the dangers characterising the drug, with the result that his life was in danger from acute Belladonna poisoning. The defendant, it was established, had given the directions usual in the circumstances and in accordance with the ordinary practice of the profession.

We do not propose to discuss the case, but merely to draw attention to the fact that the learned judge appears to have laid it down that something more than ordinary care, prudence, and foresight must be used by a medical man to exonerate him from the charge of negligence; in other words, that the care which a prudent and reasonable man employs in the practice of his profession, and the exercise of all ordinary precautions recognised by usage, are not sufficient to exonerate him from blame.

It will be seen that this view goes much further than that expressed in the first case, and that a question of deep interest and importance to the whole medical profession is involved. We trust that the verdict in the latter case, which was in favour of the plaintiff, may still be subjected to revision, since we venture to think that certain facts in support of the defendant scarcely received the recognition they deserved. Under any circumstances, both cases carry with them a warning to the practitioner of medicine, which is, that he cannot be too careful in obviating every possible ground for an action of supposed negligence on his part.

We are inclined to think that, notwithstanding the very slight risk of medical men conveying infection to their patients, many neglect the observance of these common-sense precautions which, even if of little practical value, yet serve as a good example to the public, and ought to be employed by them if only in order to allay sentimental fears on the part of patients.

George Buchanan.

THE announcement of the death of George Buchanan, Emeritus Professor of Clinical Surgery in the University of Glasgow, will recall to many of our readers one of the most genial and popular members of the profession in the West of Scotland. Following his father's footsteps as Professor of Anatomy in the Andersonian College, he joined the surgical staff of the Royal Infirmary, and soon made for himself a reputation in the days when Glasgow had the good fortune to include Joseph Lister in its galaxy of teachers. On the institution in 1874 of the Chair of Clinical Surgery, Buchanan was appointed with acclamation, and he filled the position with great acceptance and honour until his retirement a few years ago. As surgeon to the Western Infirmary, he attracted a large following of students, and was regarded as a brilliant operator, especially in cases of stone in the bladder, for in those days "cutting for stone" was held to be the crucial test of a surgeon's daring and skill. To see "Wee George" and "Big George" (Sir George M'Leod, Professor of Surgery) walking arm in arm down the corridor of "the Western" was one of the sights of that busy institution. Buchanan devised the right-angled staff for use in the operation of lithotomy; he wrote on "Camp Life in the Crimea," on lithotrity, on the radical cure of hernia in children, on talipes, ovariotomy, and on anæsthesia, while for many years he was one of the editors of the *Glasgow Medical Journal.* At social functions he was much in request, and there was no more popular or esteemed chairman at medical dinners.

Honorary Graduates in Law at Edinburgh.

THE recipients of the honorary degree of Doctor of Laws at the recent graduation ceremonial of the University included four members of the profession of medicine who have attained high distinction in various walks in life. Alexander Graham Bell was presented to the Vice-Chancellor as the author of some of the chief developments in the methods of teaching the deaf and dumb, and the practical inventor of the first articulating telephone; David Christison, the son of the "great Sir Robert," was presented as one of the pioneers and foremost representatives of scientific archæology in Scotland; George Dancer Thane as the editor of many successive editions of Quain's "Anatomy," a work which enjoys a position as a book of reference such as has been accorded to no English treatise since the time of the great anatomists of the seventeenth century. His Excellency Ernst von Bergmann, Professor of Surgery in the University of Berlin, may be said to have established his reputation in this country nearly twenty years ago, when his name became prominent in connection with the illness of the Emperor Frederick; he is a leading authority in many branches of surgery, and particularly on that concerned with the lesions of the central nervous system. The University has done itself honour by adding the names of these eminent scientists to the roll of the Honorary Graduates.

A more Energetic Treatment of the Insane.

The title of a recent pamphlet by Dr. Charles Williams—"A Plea for the more Energetic Treatment of the Insane"—leads one to expect that he is an advocate of methods of treatment which have long been justly condemned, and which now survive in this country only as haunting ghosts, though they are still in robust life in the darker corners of the world. His plea, however, is very different to this, and amounts to little more than what asylum superintendents, possessing even a modicum of energy, would themselves readily agree to. Dr. Williams thinks that patients in asylums are allowed to drift into dementia without sufficient effort being made by those in charge of their medical treatment to take advantage of remedies which are advocated as beneficial by competent authorities. Such remedies as thyroid feeding, electricity, prolonged warm baths, counter-irritation, induction of certain somatic diseases, argumentation, suggestion, or even subterfuge, and surgical operation are given as instances of such methods, which are not included in the regular routine to which every patient in an asylum is subjected if he does not soon recover. It must, however, be remembered that there is not yet anything like a unanimous opinion regarding the utility of many of these remedies, that many of them involve considerable danger, others much expense, and that in several the underlying principle is the same. But few will be found ready to deny his main plea, to make use of every remedy likely to be of service in restoring health and reason. To do this, however, it is equally certain that the medical staff in our asylums would have to the considerably increased.

We regret to have to record the deaths of Jessie Maclaren Macgregor, M.D.Edin., at Denver, Colorado; and of William Wood, M.B., F.R.C.P.Edin., of 21 Mayfield Gardens, Edinburgh.

At a meeting of the Managers of the Royal Infirmary on the 2nd April, Drs. James Haig Ferguson and William Fordyce were appointed Assistant Gynæcologists to the Institution.

ORIGINAL COMMUNICATIONS.

DEAFNESS DUE TO HYSTERIA AND ALLIED CONDITIONS.

By P. M'Bride, M.D., F.R.C.P.Ed., F.R.S.E., *Consulting Surgeon, Ear and Throat Department, Royal Infirmary, Edinburgh.*

Most authors who have written on hysterical deafness have described forms which are either associated with definite stigmata or in which the onset of the attack has been such as to leave little doubt as to the cause. Thus there can hardly be uncertainty as to the diagnosis in a patient obviously neurotic, who, after emotional disturbance, becomes suddenly deaf in one or both ears without any associated giddiness and without any change in the tympanic membranes. True, one form of specific deafness may resemble it in some points, but the collateral circumstances will enable the shrewd practitioner to arrive at a fairly definite conclusion. Probably, in such a case, the impairment of hearing will go as suddenly as it came. In this connection, it is, however, well to bear in mind that instances have been described by Sir William Dalby in which deafness due to emotion has been persistent. I have seen several cases in which a sudden mental shock has been stated to have been the cause or one cause of deafness, but on investigation it has generally been found that the patients have suffered from the affection known as sclerosis. In this form of ear disease every aurist must have remarked how the condition is altered for the worse by any circumstance tending to weakening of the general energy, be it emotional disturbance, fatigue, or child-birth. I may mention, in passing, that considering our present knowledge of the pathology of sclerosis, it is difficult to find a satisfactory explanation of this well-recognised clinical combination. However, I do not desire to enter further at present into the question of neurasthenic exacerbations of deafness due to some definable organic change, than to state my belief that this subject would well repay investigation. My wish is rather to call attention to the great difficulties which confront the otologist and neurologist when a case of deafness is met with in which hysteria may be the cause. I propose, in considering this subject, to refer to examples extracted from my case books in which it was virtually impossible to decide the question until hearing was restored. As I had not an opportunity of following up some of the histories, the diagnosis of these must remain doubtful. It may also be permitted me to remark that the fragmentary character of the notes is due to the fact that they were merely made as memoranda in my private case books—some many years ago.

The question of unilateral hysterical deafness was first brought prominently under my notice in 1885.

Case 1.—A girl, æt. 11, was taken to see me on the 28th March of that year by her father. I find it noted that tests with tuning-fork and watch were useless. The complaint was of deafness in the left ear. Removal of wax made no difference. On the 18th April she was again examined, and on that occasion my entry was as follows:—"Tuning-fork points to nerve-deafness; conversation cannot be heard unless voice be raised if other ear is stopped; has had mumps. *Diagnosis.*—Nerve-deafness from mumps or hysteria."

On 20th May 1886 I find the following record:—"Post-nasal growths; tonsils large; nasal breathing free; deafness has evidently been hysterical." No operation was performed, and when I saw her in 1887 I find that adenoids and tonsils were both smaller. Her last visit to me was on the 1st October 1888, when she could hear a low whisper at 18 ft. with the left ear. The only treatment adopted seems to have been an iodine pigment for the tonsils and arsenic and iron internally. Unfortunately I have no notes as to the condition of the left tympanic membrane, but from memory, and judging by the absence of any statement as to its condition, I think I am justified in concluding that it presented no definite changes. My recollection, too, is that the child was rather spoiled, and that at first it was impossible to elicit answers from her.

To the modern otologist many anomalies will occur as he reads this record, but let him remember that the notes were taken twenty-one years ago, and that our tests and system of case-taking were less perfect at that time. Again, operations upon adenoids and tonsils were then less frequent. But in this matter I am by no means certain that I should have acted differently now, for the reason that before we operate upon an hysterical or neurasthenic subject we ought to be absolutely convinced that operative interference is going to do good; for if it does not, it may be harmful. As an illustration, I may refer to a somewhat unpleasant experience now many years old.

Case 2.—An hysterical girl, markedly deaf from advanced middle ear catarrh, consulted me. As there was a suspicion of fluid behind the tympanic membrane on one side, I made an exploratory puncture. Almost immediately the girl became stone deaf, and did not get back to her normal condition for some days, during which period she had to be communicated with by writing.

Case 3.—In 1894, a girl, æt. 14, was brought to me with the statement that she had had repeated attacks of earache for two years, but that she had never been deaf until recently. It was stated that her nose was rather inclined to run.

Her hearing power was—

R.W. $\frac{2}{30}$ ord. voice at 18 ft.

L.W. $\frac{\text{just off}}{30}$ ord. voice at 18 ft.

The right membrane was somewhat thickened, and the left normal. On using Politzer's bag, air was heard to enter both ears. The tuning-fork was heard better on the right side from the middle line, and on closing *the ears it was perceived less clearly.* Posterior rhinoscopy revealed the absence of adenoids, but the tonsils were enlarged. Anterior nares were practically normal. As treatment, I suggested rest and tonics, and I find that I noted the diagnosis as "probably hysterical." Some time afterwards her family attendant wrote me that the subsequent course of events had confirmed my suspicions, and that the girl had afterwards suffered from "an hysterical affection of the eyes."

In this case a correct conclusion was arrived at by—(1) A process of exclusion, (2) the obvious anomaly with regard to the tuning-fork. The history of earache associated with the thickened membrane might have accounted for deafness in the right ear, but the impairment on the left side, associated as it was with a normal drum-head, could not be thus explained. There was no history pointing to any illness which could affect the auditory nerve or labyrinth, nor was there such a sequence of events as to suggest suspicion of any involvement of these parts. Finally, the fact that the patient heard the tuning-fork worse with the ears closed confirmed the diagnosis so far as this was possible.

Case 4.—In summer of 1905 I was consulted in the case of a girl, æt. 19. The following is a verbatim copy of my notes taken 6th May:—"Deaf in right ear for eight weeks; epidemic of mumps at school; patient, however, seems to have had little glandular swelling, was in bed, suffered from neuralgia of right side of the face. Both ears were somewhat affected. The left quickly recovered, but the right did not. Right ear has been painful, but is not so now; never discharge; Politzerisation has been used daily. A fortnight ago, when ear was painful, there was swelling and tenderness over mastoid (?). Never giddy. Hearing distance—R. $\frac{\text{not pressed}}{30}$ very loud voice not heard; indeed, the voice used was so loud that it ought to have been heard by the other ear, which was of course closed. L. $\frac{30}{30}$ very low whisper at 18 ft. Tuning-fork only in left ear from the middle line; it was heard also when the left ear was blocked. Galton's whistle not heard with right ear. The right tympanic membrane was a little thickened, but moved freely on Valsalva's experiment. Menstruation said to be regular. Careful testing (partly by me and partly by her own medical man, who kindly reported to me) revealed no anæsthetic areas anywhere. Two years ago was a little hysterical; mother hysterical.

"*Diagnosis.*—Mumps or hysteria.

"*Treatment.*—General; rest; arsenic and iron."

June 26.—"Hearing on right side normal. In the beginning of June heard rushing sound in right ear, but still did not hear. On the second occasion that this occurred, heard at once for a short time, but hearing went away. It then began to come back more frequently, but still has occasional periods of not hearing.

"*Treatment.*—Strychnine and hydrobromic acid."

Now here we have a case in which diagnosis at the first visit was, I venture to say, impossible. The suspicious features in the case were—(1) History of pain in the right ear without discharge—this might, however, have been due to some acute middle ear inflammation which had passed off when she was examined. (2) The fact that with the good ear closed she could not hear a very loud voice, which of course was improbable. (3) The fact that once she had been hysterical. On the other hand, the history at first sight pointed clearly to mumps, which we know may produce nerve-deafness without any other labyrinthine symptoms. This brings me to the conclusion that we cannot diagnose these cases with anything like certainty until the deafness has passed off.

I shall now refer to some instances in which I suspected hysteria, but could not prove it owing to the patients having withdrawn from observation.

Case 5.—Thus, in 1898 I was consulted as to a girl, æt. 10, who was brought with the history that she became suddenly deaf four months ago, and had remained so. An infant brother had shown signs of specific disease which yielded to the ordinary remedies. I found that she could hardly hear words at all, but that a tuning-fork was perceived to some extent both by bone and air conduction. The right tympanic membrane was flat and thickened; the left was at first concealed by wax, and when this was removed was seen to be a little indrawn. There were no adenoids; indeed, the only abnormality in the upper respiratory tract was slight crusting of mucus in the anterior nares. The use of Politzer's bag had no effect upon the hearing. On careful questioning, it was ascertained that the child had on two occasions been so deaf that she could not be communicated with, and that each time the hearing came back suddenly, the second time after a dose of salts.

In this case there was, of course, a possibility of the deafness being due to a specific taint, but it must be remembered that in hereditary syphilis the involvement of the middle ear and labyrinth which usually characterises this form of impaired hearing is, in most cases, progressive. Again, the two attacks of deafness which the history records, ran the course of hysterical rather than organic trouble.

Case 6.—In 1903 I saw a patient who stated that she had been getting deaf for eighteen months. There was a family history of deafness, and she now complained of impairment, chiefly noticed at dinner and other social functions. Both tympanic membranes were fairly normal, although the right did not move on Valsalva's experiment. The posterior and anterior nares were normal, excepting for the presence of a spine on the left side of the septum. On testing the hearing, a degree of impairment was found on both sides alike for watch and voice, namely, $\frac{15}{30}$ for watch and an ordinary whisper heard at 18 ft., at which distance I find a very low whisper should be heard in my room. On testing with the tuning-fork, it was heard equally from the middle line of the head, and bone conduction exactly equalled air conduction with Rinne's test. Inflation in no way altered the condition. The only treatment I recommended was strychnine with hydrobromic acid. Two years later I saw the patient again because of an acute middle ear catarrh on the right side. She told me that until this attack she had heard perfectly, and on examination I found the hearing in the left ear (*i.e.* that unaffected by the catarrh) $\frac{23}{30}$ low whisper at 18 ft. What made me suspect the functional character of the trouble originally complained of, was the absence of increased bone conduction, a condition in my experience always present in early sclerosis, which of course the family history suggested.

The following is a case which illustrates some of the anomalies we may meet with in the course of examination.

Case 7.—A young woman, æt. 29, noticed ringing in the ears a year before examination, and stated that six weeks afterwards her hearing had become impaired. She consulted a doctor, who ordered syringing and ear-drops, and afterwards heard better. On testing, she gave the following results:—

R. $\frac{2}{30}$ ordinary distinct voice at 18 ft. L. $\frac{2}{30}$ ordinary distinct voice at 18 ft. The tuning-fork was heard in the left ear from the middle line, and on both sides bone conduction was greater than air. The anterior and posterior nares were normal, but there was a degree of granular pharyngitis. The higher notes of a Galton whistle were not heard, but the tone limit was more lowered in the left than in the right ear. Both tympanic membranes were rather thickened, but both moved on Valsalva's experiment. After the Eustachian catheter had been passed, there was some improvement in both ears.

The patient stated that she heard worse in damp weather, that menstruation was scanty, and that she was often constipated. There were no hæmic bruit and no anæsthetic patches on the limbs, so far as could be judged from a cursory examination. On the other hand, both external auditory canals seemed insensitive, but the right was more so, for on this side the membrane and malleus could be touched without causing discomfort. At the end of examination, the tuning-fork from the middle line of the head was heard on the right side instead of on the left.

In this case the most striking points were—(1) The diminished sensibility of the canals and membrane; (2) the change of statement as regarded the hearing of the tuning-fork. The lowering of the upper tone limit associated with increased bone conduction was also rather remarkable. Presumably, if there was an hysterical element in this case, it was only in part responsible for the deafness.

The literature on our subject is fairly extensive, but if I may be allowed the expression, rather unsatisfying. Thus Gruber[1] states that hysterical deafness is usually unilateral and combined with hyperacusis of the opposite ear, and then passes on to consider the phenomenon known as "transfert." Politzer[1] also finds that the deafness is usually confined to one side, that bone conduction is lost, and that it is associated with diminished sensibility —in fact, with marked stigmata. Dench[2] describes the deafness as coming on suddenly, frequently after some severe shock, and as never varying throughout its course. He, too, then goes on to describe the transference from one side to the other. This author, however, enters rather more fully into the question of diagnosis. "Functional examination also may reveal nothing characteristic, although in quite a number of cases we find that both the upper and lower limits of the scale are poorly perceived, the lower tone limit being elevated while interference with the upper tone limit seems to be more common than with the lower, the high notes being but poorly heard as a rule. This reduction of the upper tone limit is distinct, usually extending as low as 4 or 6 of the Galton scale."

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[1] "Lehrbuch der Ohrenheilkunde," 1888, S. 632.

"A symptom frequently met with in an examination is the alternating perception of the high notes, first on one side and then on the other. Upon one side the upper tone limit will be found greatly reduced, while the organ of the opposite side will perceive the highest tones of the scale with ease. On repeating the experiment, the condition will be exactly reversed, and this alternation may be repeated several times during the examination."

In concluding my reference to text-book literature, I may be permitted to quote from Oppenheim,[3] the author of our most recent and probably most complete work on the nervous system. "Unilateral hysterical deafness does not interfere with hearing, as a whole, to any great extent. One does not usually observe the patients putting forward the healthy ear in order to catch the sound. Often they are not aware of the deafness; the opinion has even been expressed that this one-sided deafness is compensated for in binaural hearing. Bilateral deafness is usually only a transient phenomenon. It follows mental excitement, fits, or a loud noise, in which case fright is probably the active agent. Bone conduction is almost always lost, and a positive result is obtained on Rinne's experiment." I have thus quoted from some representative text-books, not because they alone refer to hysterical deafness, but because they show the views which are held upon the subject by writers who are or have been authorities.

I shall not endeavour to give a full account of the literature on our subject as it exists in scattered papers, as this would prolong the present article most unnecessarily. Suffice it to state that, relatively, recent papers on this subject have appeared from the pens of Wiebe,[1] Dölger,[2] and Thanisch[3] in German, and a joint-communication by Boulay and Marc'hadour[4] in French. The first-named records three cases of hysterical deafness, all in males. Although, from the histories and collateral circumstances, it is extremely probable that the patients whose histories are given owed their impairment to hysteria, conclusive proof is not furnished, in so far as Wiebe was unable to record recovery of hearing while under his observation. Dölger gives the history of a case in which there was hyperæsthesia of the meatus, and in which the tuning-fork was heard better on the opposite side. In the patient of Thanisch two attacks of bilateral deafness were observed, and giddiness was associated with the first. Among other symptoms, it is noteworthy that in this patient, too, not only were the ears hyperæsthetic, but the whole body. The paper by Boulay and Marc'hadour will require more detailed discussion, as, under the title "De l'element psychique dans les surdités," they discuss a class of cases very similar to those which I have described at the beginning of this paper, although, as we shall see, they only record one where the diagnosis seems to have been quite satisfactory. I shall, therefore, make no apology for quoting their views.

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[1] "Lehrbuch der Ohrenheilkunde," 1901, S. 638.

[2] "Diseases of the Ear," 1903, p. 666.

[3] "Lehrbuch der Nervenkrankheiten," 1905, S. 1061.

"We know that hysteria may affect a perfectly healthy ear, or graft itself upon an already existing lesion; that sometimes deafness is the first and only manifestation of the neurosis (*hystéric mono-sensorielle*): that it may be associated with dumbness or blindness, or, indeed, occur as an additional symptom in the course of the confirmed great neurosis (*grande nevrose*)."

"But whether the dynamic trouble (*trouble dynamique*) occupies the whole scene, or whether it is superadded to an affection of the ear, it is always possible to track it, for it has from its beginning a special stamp. Gradenigo, then Chavanne, have brought into view the characteristics of hysterical deafness: diminution or absence of sensibility of the meatus and membrane, disappearance of perception for high and medium sounds, absence of subjective troubles, diminution or disappearance of bone conduction, etc. These points are, besides, of unequal value. What is constant in hysterical deafness is diminution of bone conduction; when deafness is total, this is reduced to *nil*; in all cases it is inferior to air conduction."

"Let us recall for a moment the theory of the neuron; in hysteria the central neuron has lost its connection with the peripheral; also hysterical deafness always recalls in its features the characters of a central deafness. This clinical fact, upon which one of us has already insisted in a previous paper, has a corollary—the absence of subjective phenomena; excepting when hysteria complicates an ancient impairment of hearing depending upon anatomical changes, the affection runs its course without giddiness or tinnitus."

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[1] *Deutsches Arch. f. Klin. Med.*, Leipzig, Bd. lxxi. S. 133.
[2] *München. med. Wchnschr.*, April 4, 1905.
[3] *Arch. f. Ohrenh.*, Leipzig, Bd. lxvi. S. 116.
[4] *Ann. d. mal. de l'oreille du larynx, etc.*, Paris, 1904, November.

"By the side of these well-defined aural manifestations of hysteria, one meets with in a large number of patients functional troubles of the ear which have sometimes been confounded with them, under the rather too comprehensive denomination of psychic deafness, but which appear to us for the most part to be independent of the great neurosis; not only do the deaf persons in question not present any of the stigmata of hysteria, but even examination of their ears does not permit one to recognise any of the signs we have just referred to."

The authors then go on to consider whether in a number of deaf persons inattention is not often a prominent factor in their disability. They also point out that in many cases anxiety to hear, and the fear of not hearing, contribute largely to their difficulty. That they are correct in their statements can probably be confirmed by the experience of every aurist, but I should say that in most cases oft his kind I have met with, the ear lesion has been what is now termed sclerosis of the middle ear, or osteoporosis of the labyrinthine capsule, with fixation of the stapes. When, however, after referring to the torpor of the auditory centres in deaf mutes and those whose hearing is seriously impaired, they go on to state that analogous psychic trouble may be present in those who are only slightly deaf, and that this may in some instances produce complete deafness analogous to what is met with in disease of the internal ear, I am by no means inclined to agree with them that we are entitled to consider these cases as coming into a different category for hysterical deafness. This, however, is at best a discussion as to nomenclature. With the statement that "it is the paradoxical character of the results yielded by examination of the hearing which will permit us most frequently to arrive at a diagnosis," I am thoroughly in accord. Boulay and Marc'hadour describe three cases at length. The first is that of a neurotic lad with middle ear catarrh and retained bone conduction, completely deaf in one ear, in whom suggestion effected very marked improvement; among other tests he was afterwards able to hear a whisper at six metres from the hitherto deaf ear. The facts upon which the diagnosis of a functional condition was made were briefly—(1) The patient could hear a tuning-fork of medium pitch in front of the deaf ear, although he could not understand the loudest voice. (2) A tuning-fork of high pitch was not heard in front of the meatus or from the mastoid when the test was being made. The patient stated, without his attention being called to the pitch of the instrument, that he never could hear high notes, such as a flute in an orchestra. (3) Neither the high fork nor Galton's whistle were perceived in the other ear.

It was then these apparent contradictions which led to the diagnosis, but the authors feel justified in considering the case as being not hysterical, because—(1) There was no stigmata, (2) bone conduction was preserved. As before stated, I am not inclined to agree with this distinction, at least until our knowledge of hysteria and neurasthenia has become more definite than at present. The second case described by the French writers is one of incipient sclerosis benefited by suggestion, *i.e.* the catheter was passed, but no air blown through. The diagnosis here seems to have been founded on the statement of the girl's mother, that she could hear better when the subject interested her. The third and last case was that of deafness remaining after acute middle ear inflammation and temporarily relieved by the catheter. When suspicion was excited, washing out the nostrils associated with a suggestion of better hearing was tried, and the result was the same as after passing the catheter. Eventually the hearing was much improved. This case is not very convincing in my opinion, because—(1) The results of testing with a watch only are given, and we know that all patients are liable to be influenced by suggestion with regard to this particular test. (2) The deafness may have been gradually passing away owing to absorption of inflammatory products.

A comprehensive study of hysteria of the ear comes from the pen of Gradenigo, which is undoubtedly the most complete which has appeared on the subject, and which even now, ten years after its publication, holds its place as the most authoritative work on the subject with which it deals.[1] It would be out of place, and would, moreover, make this paper exceed its legitimate limits of space, were I to attempt to give a résumé of Gradenigo's work. It will be sufficient to indicate some of the more important points. It would appear that the author is inclined to classify hysterical deafness into two great divisions, namely—(1) Cases associated with general hemi-anæsthesia; (2) cases associated with other lesions, *e.g.*, organic affections of the ear, deafness resulting from trauma or toxic influences such as typhoid. He also describes under a special heading cases of hysterical deaf mutism. The most important chapter, however, is that entitled "Characteristics of Acoustic Anæsthesia in Hysteria." According to Gradenigo, in hysterical hyperæsthesia of the acoustic nerve—if sufficient hearing power to enable tests to be made is retained—the deafness will be equal for notes of different pitch, that is, there will not be found marked difficulty in detecting low notes as in middle ear deafness, nor high notes as in labyrinthine disease. With regard to Weber's experiment (the hearing of the tuning-fork from the middle line of the head), it is specially stated that the results may vary—the tone being sometimes not perceived by the affected side, and sometimes more strongly perceived, more particularly if there be some lesion of the sound conducting apparatus, however slight.

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[1] "Ueber die Manifestationen der Hysterie am Gehororgan," Jena, 1896.

This statement is of special interest in view of the contention advanced by Boulay and Marc'hadour, in favour of distinguishing between psychic and hysterical deafness (see above). Rinne's experiment is found positive, and the tuning-fork is heard a shorter time by bone conduction than in a normal subject (experiment of Schwabach). In testing with a strong ticking watch, Gradenigo made out that in hysterical deafness in which a whisper was not heard above 5 metres, the hearing was relatively better for the watch than for the voice. I must admit that I do not quite follow the author in his line of reasoning, for so much must depend upon the strength of the watch and whisper. I am much more ready to acknowledge the great value of the next symptom he discusses, namely, variability of the hearing power. To translate his own words, " One of the most important characteristics of acoustic hypæsthesia is supplied by the frequent and rapid changes in auditory acuity. Such changes may partly occur without assignable cause, partly after the use of remedies (*asthesiogener agentien*)." Gradenigo lays considerable stress upon the presence of diminished excitability of the auditory nerve as a diagnostic point in hysterical deafness; for, as most aurists know, he believes that in cases of severe organic lesions of the nerve or labyrinth, electric excitability is increased. He remarks also upon the comparative rarity of tinnitus and giddiness in hysterical deafness, although both symptoms may occur. In discussing the connection between hysterical deafness and anæsthesia of the auricle and meatus, Gradenigo is inclined to conclude that in the majority of cases one is proportional to the other, whether the patient be the victim of general hemianæsthesia or not. Before passing on, I may mention that Gradenigo gives a very full list of works bearing upon hysterical deafness, to which the reader who desires to investigate the subject further may be referred.

From what has been adduced, it will be obvious that most—if not all—writers are inclined to associate hysterical deafness with other definite stigmata—notably anæsthesia, either extending over one side of the body or confined to the ear. My purpose has been to show that in this country we may meet with cases in which other evidences of hysteria, if present, are more or less hidden, so that diagnosis becomes a matter of extreme difficulty. Indeed, so difficult is it, that I do not think it is possible until after the disappearance of deafness. At best we may suspect, and in extremely favourable cases we may go a little beyond suspicion, but must, in my opinion, always stop short of certainty. In investigating one of these cases, the history must be gone into with scrupulous care, and then compared with the results obtained from hearing tests and objective examination. Any inconsistency must be carefully considered and weighed. The questions the observer must put to himself are—

1. Is there any marked discrepancy between the history and the results afforded by objective examination?
2. Do the history and manner of the patient suggest hysteria?
3. Do history and results of examination accord with any of the recognised forms of organic deafness?
4. Is there any evidence of sudden improvement of hearing when the patient is interested?
5. Do repeated hearing tests give the same result?
6. Is there any anomaly of hearing? *e.g.*, Does the patient with the good ear closed fail to hear a voice so loud that it ought to be detected by the closed ear? Does he or she hear the tuning-fork by bone conduction worse when the good ear is closed? Do hearing tests give varying results?

I think that investigation on these lines will give more accurate information than can be furnished by deductions from hearing tests alone, although of course these must not be neglected. Thus, we cannot conclude that a case is not hysterical because bone conduction is not absent. It is difficult to reach any conclusion as to the hearing of sounds of different pitch by an ear which is for the time very deaf. It is only when we can prove variations in the hearing power which are inconsistent with deafness depending upon an organic change, that we begin to approach a definite diagnosis. Here I must leave this interesting subject, without, I fear, being able to give any definite methods of detecting hysterical deafness, unless indeed other unmistakable stigmata be present. The aurist, when a doubtful case presents itself to him, must pass everything in review, and on the lines I have indicated, both in my concluding words and in my remarks appended to the notes of cases, attempt to discover some discrepancy, and, having found one, must look for others. It is customary for writers upon rare affections to discuss the prognosis, but in suspected hysterical deafness, without other evidences of hysteria, it is the diagnosis which must be guarded, for the diagnosis only becomes clear when there is no longer a question of prognosis,—in other words, when hearing has returned.

THE RADICAL CURE OF INGUINAL HERNIA.[1]

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(Plates XII. and XIII.)

Before reviewing the methods adopted for the radical cure of inguinal hernia, I desire to make quite clear the principles underlying the procedure as you see it carried out in this theatre.

First, the question of the position of the cord is of importance. Normally, at its exit from the abdomen it is supported on the pubes, its upper surroundings being fibrous, and so arranged anatomically that no variation of muscular action causes compression of the pampiniform plexus. Now, in some of the modern methods the cord is transplanted so that its point of exit is a muscular ring, which must unduly disturb the vascular condition of the testicle, thus rendering the new condition as far from normal as possible. I hold that the further we depart from the normal anatomical relations in repairing the abdominal wall, the more we recede from the ideal operation.

We next study the plan of reconstruction of the abdominal wall. For a long time, as shown by the earlier methods of operation, an idea prevailed in the minds of some surgeons, that the essential step in this procedure was the closure by some means of the neck of the hernial sac, and so invagination, folding, twisting, and other methods were recommended. All of these procedures were futile, as any one would expect who knows the elastic nature of the peritoneum, and the ease with which it slides off the middle stratum of the abdominal wall. Some of them are positively dangerous, and in this category I would give twisting first place, as it is accountable for dragging on the bladder, by drawing the false ligament up into the inguinal canal, and in young subjects the bladder itself has been drawn up and urinary fistula produced by the sutures of fixation passing through that viscus. Another danger consists in the fact that atrophy of the testicle has resulted from this method. In a recent case in which the hernia had returned, dissection proved that the cord was converted into a fibrous mass where the sac was twisted and massed round it. This case had been operated on originally by the most vigorous advocate of torsion. *All the methods in which the sac is retained for the purpose of reconstruction I believe to be unsound in principle,* because the retained mass does not belong to the essential supporting part of the abdominal wall. The peritoneum was never intended as a mechanical support, its function being purely physiological.

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[1] A clinical lecture delivered at St. Vincent's Hospital, Dublin.

To my thinking, ligature of the neck of the sac high up and resection allows retraction of the stump, so that the inner surface of the peritoneum assumes at once its normal condition.

We now come to deal with what I look upon as the all-important step in the effort at radical cure. I allude to the repair of the defect in the middle stratum of the abdominal wall, which has allowed the passage outwards of the lining of the abdomen and some parts of the contents thereof. Macewen was almost the first to realise the necessity for closure of the mid-stratum of the abdominal wall, and his fixation of the conjoined tendon to Poupart's ligament paved the way to the methods of to-day.

Before passing in review the different operations now in vogue, I shall explain the steps of the procedure which I have for twenty years carried out in my efforts to repair defects of the inguinal portion of the abdominal wall.

The skin incision extends outwards from the centre of the arch formed by the external ring, and runs parallel to Poupart's ligament, well beyond the internal ring; the external oblique is split in this direction and to this extent, as shown in Plate XII., Fig. 1. Toothed clip forceps fixed to the pillars of the external ring hold these apart, as shown at A, so that with a blunt dissector the conjoined tendon B and Poupart's ligament C are fully exposed and freed of cellulo-fatty tissue.

Next, the cremasteric elements and internal spout-like fascia are split between forceps, and the sac exposed and freed up to the internal ring, at which point (after opening to see that no tags of omentum adhere to the neck or mouth) a Bantock's ligature is applied and the sac is resected. This done, a continuous catgut suture closes the cremasteric tissues, as at D. Next, as many sutures of stout silk as seem necessary (three to five, as at E) are passed through Poupart's ligament on the outside, and the conjoined tendon and the internal oblique and transversalis muscles on the inside up to the internal ring. The tying of these, as in Plate XII., Fig. 2, X, completes the first step in the reconstruction of the mid-stratum. Now mattress sutures are applied, as in Plate XIII., Fig. 3, F, so as to bring the external pillar and the neighbouring portion of the external oblique tendon G, Plate XIII., Fig. 3, upwards under the inner pillar H, which in turn is drawn down by interrupted silk sutures and fixed to the outer side of Poupart's ligament, as at K, Plate XIII., Fig. 4.

This procedure brings a broad surface of conjoined tendon and its associated muscles into contact with Poupart's ligament and a broad surface of the external oblique; while the suturing of the inner pillar of the ring to Poupart's ligament brings extensive surfaces of the external oblique tendon in contact with each other, thus completing the reconstruction of the middle stratum of the abdominal wall.

Every day brings me fresh evidence of the soundness of the views I formed more than twenty years ago, as to the proper method of reconstruction of the abdominal wall. The following extract from the *Transactions of the Southern Surgical and Gynæcological Association* shows that there is a widespread belief in the soundness of these views:—

"*Overlapping the aponeuroses in the closure of wounds of the abdominal wall.*—Dr. Charles P. Noble of Philadelphia recommended a method of overlapping the aponeuroses which he has used with the utmost satisfaction for nine years in the closure of all wounds of the abdominal wall, including the Alexander operation, inguinal and umbilical hernia, diastasis of the recti muscles, appendicectomy, and nephorrhaphy. In but a single case did he know of a post-operative hernia where the abdominal wound had been closed by this method. When drainage is employed through the abdominal wound, the method is not applicable. The technique of the operation was illustrated by several drawings, which demonstrated clearly the method. He closed his paper by describing the methods of overlapping the fasciæ employed by Lucas-Championnière and E. Wyllys Andrews in the operation for inguinal hernia."

I have had several opportunities of inspecting the result of this procedure, as at times patients have come to me complaining of pain which I found to be occasioned by the ilio-inguinal nerve being caught up in the scar tissue. On every occasion I have been able to demonstrate an abdominal wall of much more than normal strength, and I have satisfied myself that, given a patient in ordinary health, the results of this procedure are quite satisfactory; and out of over 500 operations of this kind I have not had a death, and in the absence of just cause, such as undue strain by coughing before union was complete, I have not seen a recurrence.

I would like now to briefly review some of the procedures at present in vogue for the radical cure of inguinal hernia.

Kocher's operation.—An incision is made above and parallel to the inner two-thirds of Poupart's ligament. The characteristically directed fibres of the aponeurosis of the external oblique are exposed, and the hernial sac is completely isolated. Now comes the *characteristic* and *essential step* of the method. A small opening is made in the strong portion of the external oblique, above and external to the region of the internal abdominal ring, and a special pair of curved dressing forceps is pushed through it, *i.e.* through the aponeurosis of the external oblique, and the muscular fibres of the internal oblique, and along the inguinal canal in front of the spermatic cord, to emerge at the external ring, where they are made to seize the fundus of the isolated hernial sac, which is drawn from below upwards and outwards along the canal, and through the small opening above mentioned.

Traction is now made upon the sac in an outward and somewhat upward direction away from the cord, and the funnel-shaped opening at the neck of the sac is drawn well into the small opening in the abdominal wall. The portion of the sac which is brought through the opening is now transfixed and stitched to the adjacent part of the abdominal wall. The sac is now folded together and placed upon the *outer surface* of that part of the external oblique which forms the anterior wall of the inguinal canal, and is fixed to it by two or three sutures. The remainder of the sac is cut away. The sutures which fix the sac should take as deep a grip as possible of the upper and lower walls of the canal, and should therefore pass immediately over the spermatic cord, which is kept pulled downwards and protected by means of the finger introduced into the canal.

Ball's operation consists in freeing the peritoneum on the inner aspect of the internal abdominal ring, and then the sac, after being isolated, is twisted into a tense cord, so as to throw the serous membrane into a series of folds, thereby producing a prominence internally rather than an infundibuliform depression. To prevent untwisting, a ligature is tied round it as high as possible, and it is also transfixed below the ligature by a thread, the ends of which are passed through the abdominal parietes.

Barker's operation.—The neck of the sac is isolated, ligatured, and divided, the fundus being left *in situ*, whilst the thread used in tying the neck is employed as the first suture to close the deep part of the canal; by this means it is hoped that the neck of the sac will be displaced, and hence more satisfactorily occluded. It is very doubtful, however, whether this really occurs.

Macewen's method consists in opening up the inguinal canal by dividing the aponeurosis of the external oblique, freeing the under surface of the abdominal parietes for some distance around the internal abdominal ring, and in placing therein, as a pad across the internal opening of the canal, the sac which has been previously isolated and threaded through with silk in such a way as to throw it into folds. The silk thread is then passed by means of a needle through the abdominal parietes on either side, and fixed by traversing the aponeurosis of the external oblique once or twice. The canal is subsequently closed with sutures which are passed in such a way as to draw up Poupart's ligament over the arched fibres of the internal oblique.

In *Bassini's operation*, the external oblique aponeurosis is divided, so as to expose the lower arched fibres of the internal oblique. The sac is ligatured and removed, as also any varicose spermatic veins, and the structures of the cord displaced and drawn forwards and outwards through the wound in the external oblique. The canal is completely closed behind the cord by a row of sutures, securing the lower arched fibres of the internal oblique to the under surface of Poupart's ligament. The cord is then replaced, and the divided fibres of the external oblique are sutured over it.

Halsted's operation is much the same, except that the fibres of the internal oblique are also divided at the outer margin of the internal ring, and the cord displaced upwards and outwards through this opening, so that at the spot at which it pierces the abdominal parietes it may be surrounded by muscular fibres. The canal is then closed as in the former operation, whilst the external oblique is also sutured behind the cord, which is thus made a subcutaneous structure.

Method of Banks.—The sac having been made certain of, is separated from the cord, and detached through the external ring up in the canal as high as the internal ring, the finger keeping note all the time of the position of the cord. If the sac is clearly empty, its neck is now ligatured with stout chromic gut or carbolised silk as high up as to leave no neck, orifice, or dimple at the internal ring. The fundus is then cut away about half an inch below the ligature. As to the sutures of the ring and canals, it would appear from his latest paper that Mr. Banks is now satisfied with suturing the external ring. In inguinal hernia, in addition to this (dissecting out and removing the sac as high up as possible), the pillars of the external ring have been pulled together by two or three silver wire sutures, which are left in position after their ends have been cut very short.

Method of Bennett.—The sac is exposed and carefully isolated from its connections just below the external ring (the lower part being left entirely undisturbed); it is then opened, and the contents reduced into the abdomen, if they have not already returned spontaneously. The sac is now divided just below the external ring, the distal portion being allowed, after all bleeding has been stopped, to drop back into the scrotum. The proximal part of the sac is next separated from the sides of the canal as high up as the internal ring by gentle manipulation. One finger (or more if the ring is large) of the left hand having been introduced into the abdominal cavity through the neck of the sac, any bowel lying near the internal ring is pressed back out of the way. An ordinary pile needle on a handle (unthreaded) is then made to enter the abdominal aponeuroses, about three-quarters of an inch above the upper margin of the external ring, a little to the outer side of its middle line, and transfixes the whole of aponeuroses and peritoneum, impinging on the end of the finger which occupies the neck of the sac. The needle, guided by the finger, is passed down the inside of the sac, and made to pierce its outer wall at a point about half an inch from the cut edge. The needle having been threaded with a tendon or catgut suture, previously prepared, and not less than twelve inches long, is withdrawn, taking one end of the suture with it. The result is that one end of the suture is seen passing into the abdominal aponeuroses above the external ring, while the other issues from the outer wall of the proximal part of the sac, near its cut edge. The needle, again unthreaded, is now made to transfix the abdominal aponeuroses and peritoneum about half an inch internal to the point at which it entered before, traversing the sac in the same way, finally piercing the inner wall at about the same distance from the cut edge as it had done on the outer side. After having been threaded with the lower end of the suture, the needle is withdrawn, carrying the suture, as before, with it. The two ends of the suture will now be seen entering the aponeuroses above the external ring, and forming below a loop over the cut edge of the proximal portion of the sac. The open end of the sac is next sewn up by a continuous stitch of catgut or silk, or occluded by a silk ligature placed around it as close as possible to the spot at which the invagination suture pierces its sides. The succeeding step is the invagination of the sac, which is effected by pushing with the finger the closed end through the canal into the abdomen, the invagination suture passing through the aponeuroses being at the same time drawn tight. By this proceeding the sac is turned completely outside in, and its fundus firmly attached to the peritoneal surface of the anterior abdominal wall some distance above the internal ring.

Stanmore Bishop's method.—This is a modification of Professor Macewen's. The sac having been freed entirely up to, but not beyond, the internal ring, is carefully emptied, and kept so by the finger of an assistant pressing upon the ring. By means of a long strong catgut suture, which is passed through each side of the sac, this is hemmed round, and thrown into a number of folds. The neck of the sac is then invaginated, and each end of the suture carried by a needle through the canal, and through the pillar of the internal ring nearest to it, from within outwards. When both ends are presenting through the muscular structures, they are pulled up, the sac being at the same time invaginated before the finger as the threads are drawn upon. The sac is then drawn inside out on its passage, and becomes fixed as a rounded boss exactly over the inner ring, its peritoneal surface being turned towards the intestines, and its first fold on either side being firmly applied to the peritoneum immediately within the ring. The ends of the suture are then tied firmly, but not tightly, over the ring; finally this and the canal are sutured.

M'Burney's method.—This is different from all others described, in that, instead of trying for primary union, the wound is made to heal by granulation tissue.

The sac having been reached by an incision exposing the whole canal and external ring, is separated and tied as high up as possible. The part below the ligature is then cut away. In order to keep the wound an open one, the superficial are then stitched to the deep parts—skin and conjoined tendon are sutured together above —skin and Poupart's ligament below. The wound is then packed with iodoform gauze. The wound is thus made to fill up by granulation tissue, producing a thick scar, which M'Burney believes to be the best guard against relapse.

Cheyne's operation.—"The operation as I have described it is in its essence Bassini's, but it is not carried out exactly as he describes,—in fact it is a combination of various operations. Thus the method of cutting off and tucking up the sac and the use of the silk is borrowed from Barker; the principle of bringing the internal oblique to Poupart's ligament behind the cord is Bassini's, but the mode in which the stitches are applied is borrowed from Macewen; the use of silkworm-gut for the incision in the external oblique is from Stanley Boyd; the boot-lace suture I used myself, but I find that Boyd has also used it."

A word now in reference to these procedures.

Let us first take the displacement method so vigorously advocated and so generally carried out, and we find that the latest outcome of the genius of Kocher has within itself the germs of failure, and that it requires but time to dispel the illusion as to its perfection. The great name of Kocher has secured for this procedure a position which, as an operation, it would in other circumstances have no chance of attaining. Easy of application, perfect in its immediate result, it seemed to be the acme of perfection; but when we come to study the details of the procedure closely, we discover a weakness which is certain to lead to the abandonment of this method, at least in part.

The principle on which operations on herniæ should be carried out is the proper reconstruction of the canals through which they travel. In Kocher's method an effectual bar is put to any such effort being made—first, by the want of free opening of the inguinal canal; and, second, by the interposition of the hernial sac between its walls. I fail to see the grounds for the substitution of this procedure for methods already extensively and very successfully carried out. I object to the other steps in this procedure, because, first, the suture at the internal ring is made in the dark, and any blind procedure of this kind is unsound in principle; second, the suture of the canal itself includes the external oblique tendon, and must therefore be faulty, as it causes the intervention of a very avascular tissue between the internal oblique and the deep aspect of Poupart's ligament. Ball, Bennett, and Bishop in their procedures fail to recognise the one essential of a sound operation for hernia, namely, accurate repair of the inguinal canal. Devoting all their energy to the minor detail of dealing with the sac, they seem to forget that the elasticity and the capacity for sliding possessed by the peritoneum allows it to accommodate itself to any inequalities of the middle stratum of the abdominal wall, and to find out any point of weakness therein under pressure of the abdominal contents. Banks, too, depends on closure of the abdominal end of the sac, and makes no attempt at restoration of

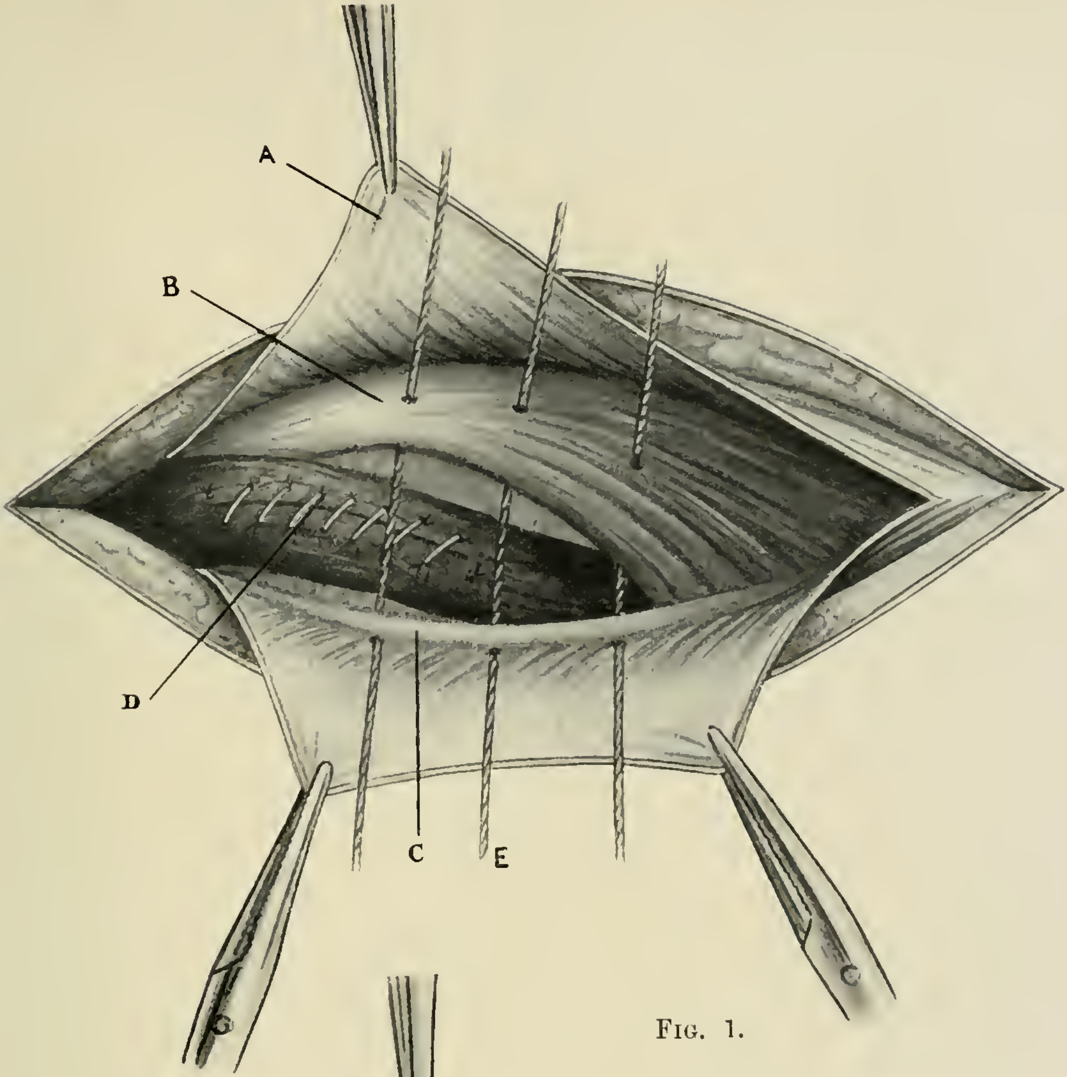
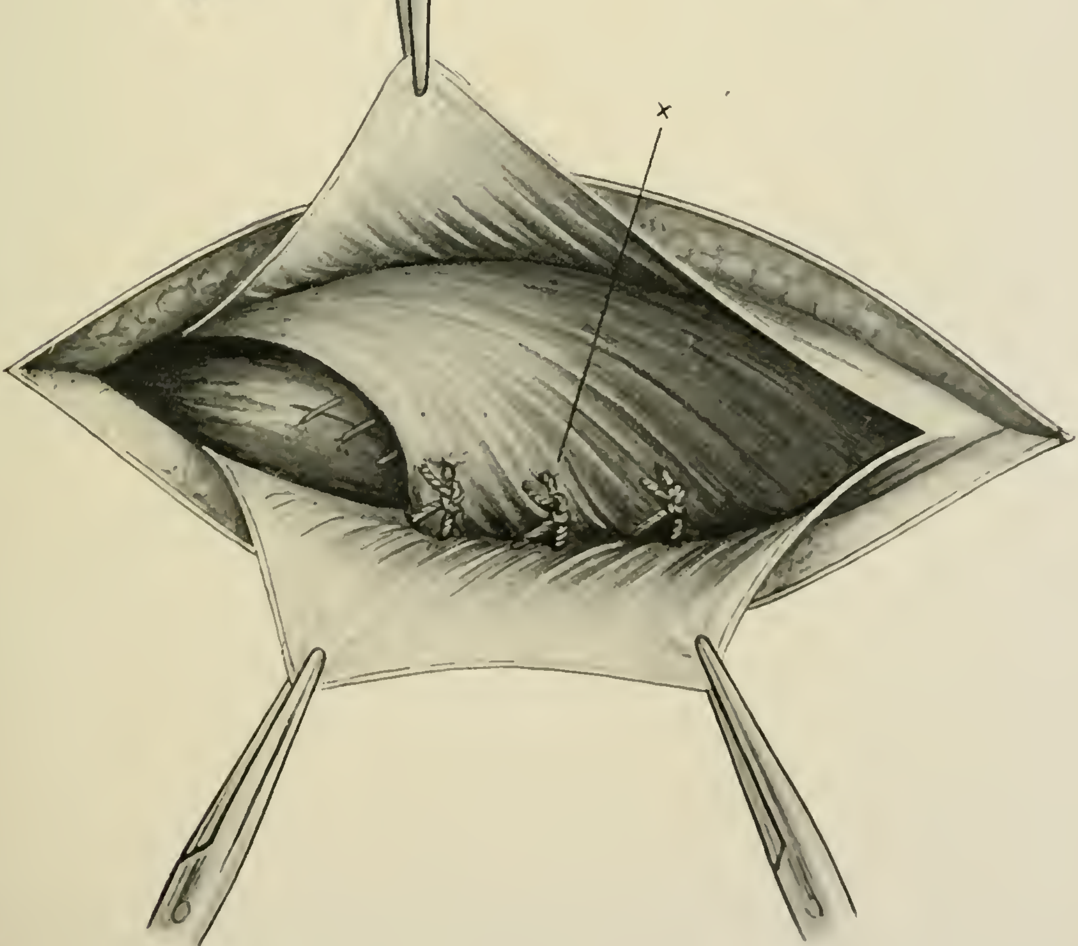


FIG. 1.



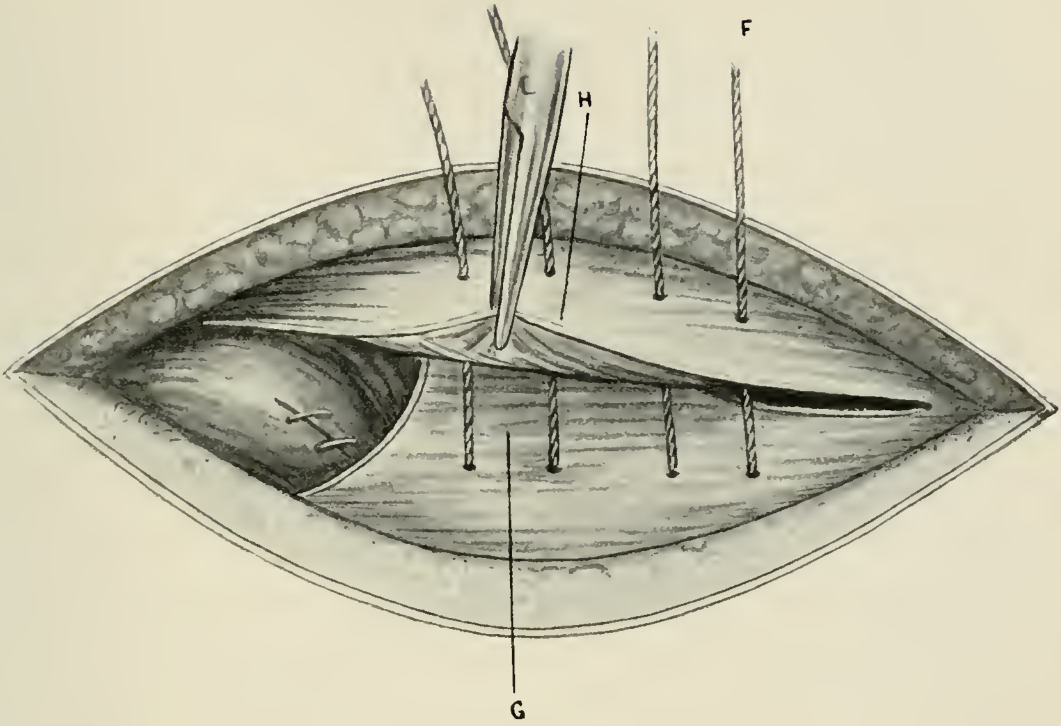


Fig. 3.

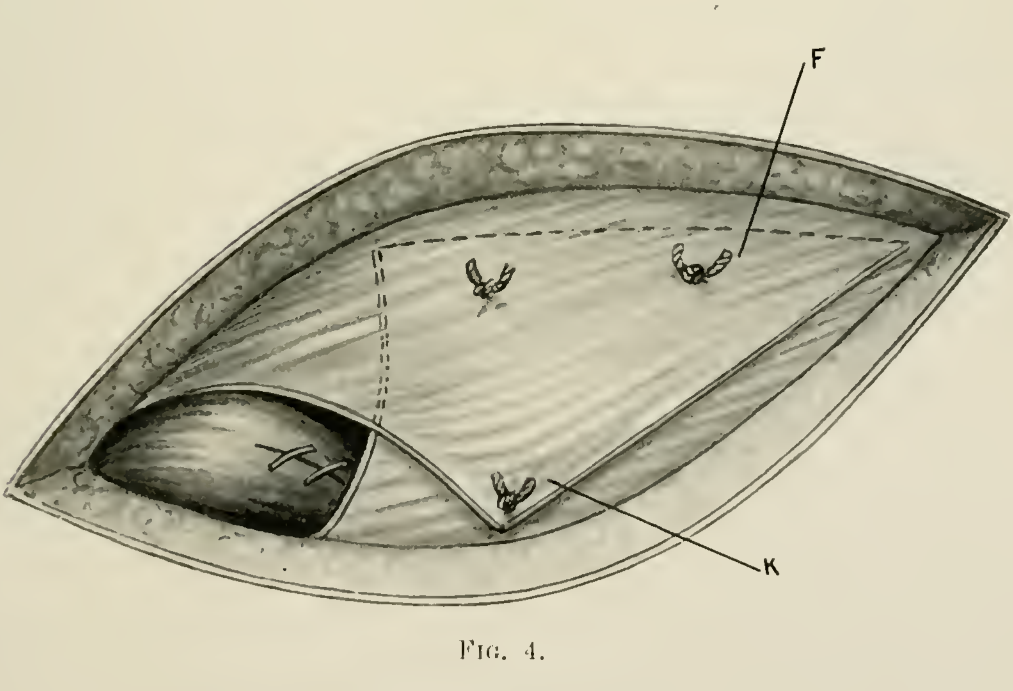


Fig. 4.

the mid-stratum of the abdomen. Notwithstanding the over-much laudation we hear of the method of Halsted, a modification of that of Bassini, I have a strong objection to it. Interfering with the course nature originally arranged for the passage of the spermatic vessels and duct does not seem the correct way to start. My faith lies rather in the opposite course—that is, to bring the structures as nearly as possible to the line in which we find them in normal man; besides, it is a matter of notoriety that the part of the inguinal canal over the pubes is not closed completely, even after making a secondary opening for the passage of the cord.

Thus we have two openings instead of one, and until we have statistics reliable enough to convince us that recurrence is not more frequent after this method than after the methods we have carried out for the past twenty years, I for one shall persistently refuse to carry out this plan, unless as a demonstration for my class in the school of operative surgery. Another point I wish to accentuate is that after this operation, if there be any yielding of the abdominal wall, and truss support becomes necessary, the abnormal position of the cord prevents its use.

A word as to the statistics of these operations. I was called suddenly one morning recently to a gentleman, æt. 65, who for many years had an irreducible left inguinal hernia, which he carefully preserved in a leathern purse. For some days before my visit he suffered from constipation, which had not yet been relieved; vomiting had set in during the night, and was now stercoraceous. I told this gentleman that operation alone could save him. "Then I'm done for," was his reply. His opinion did not weigh with me, so I continued in silence to determine exactly the operation I felt certain I would be compelled to carry out immediately. Before long the reason for my patient's fear was explained. For thirty years his successive medical advisers had informed him that his heart was very bad, and that the mortality from hernial operations, even in those with good hearts, was 60 per cent. He reasoned, then, that his was a very poor chance indeed. The reasoning was sound, but where did the statistical premise come from? This gentleman went on the table full of the notion that his heart was unequal to the task I desired to impose on it, and I fear my eloquence availed little in dispelling statistical error. My scalpel has done more than my logic to dispel for ever the illusion as to his heart, and he believes with me that his advisers were only guessing at the mortality of hernia operations. That hernia occasionally returns, however carefully the operation is carried out, is easy to prove, but to secure that all cases which recur return to the first operator is impossible; this is why the statistics are unreliable. The statistics of mortality, however, are very different. The patient is under observation long enough to show what influence operation has for life or death, and so we can decide this question offhand when we have enough material to go on. For myself, I have long since decided that, given a patient otherwise in good health, there is no justification for any mortality, and we should be careful that our medical brethren do not quote the statistics of the anti-Listerian era, or the results of those who still elect to live in that period, as regards operative procedures.

CONCLUSIONS.—1. Without opening up the inguinal canal, no complete operation can be performed.

2. It is a matter of little importance what you do with the hernial sac; it has no bearing on the case, as long as you dispose of it so as to leave the inner surface of the abdominal wall perfectly smooth, since that condition is characteristic of it in the healthy subject. A new sac forms with the greatest readiness, if at any point the mid-stratum of the abdominal wall is defective.

3. There is no evidence in favour of opposing the arrangements of nature by displacing the cord, as in Bassini's method.

4. To properly reconstruct the inguinal canal, the internal oblique and transversalis muscles as well as the conjoined tendon should be brought down to Poupart's ligament.

5. The complete overlapping of the pillars of the external ring forms a firm basis of support for the healing of the underlying structures.

ON THE VIOLATION OF COURVOISIER'S LAW.

By B. G. A. MOYNIHAN, F.R.C.S., *Leeds.*

THE differential diagnosis in cases of obstructive jaundice may be difficult, and is sometimes impossible. In order to increase our chances of accurate diagnosis to the fullest extent, the closest attention must be paid to every separate symptom and to every different grouping of the individual symptoms. The most important clinical aid to diagnosis is that which is now generally known as "Courvoisier's law." The facts upon which this law is based were first collected by Courvoisier, and are given in detail by him in his monumental work.[1]

Recently the "law" has been associated with the name of Terrier; and is referred to as "Terrier's law," or "The Courvoisier-Terrier law," but the French surgeon has not the least claim to priority in this matter; the credit of the work accomplished is to be given to Courvoisier alone. Terrier himself indeed acknowledges that the first ennunciation and demonstration of the law were due to Courvoisier.[2]

The details given by Courvoisier upon which the law is based are as follows:—

[1] "Beiträge zur Path. und Chir. der Gallenwege," S. 58.

[2] *Bull. et mém. Soc. de chir. de Paris*, 1900, p. 1045.

Up to the time when his review of the literature was made, there were recorded 187 cases of obstruction of the common duct from all causes. Of these, 100 were due to obstruction from causes other than stone, and eighty-seven were due to obstruction by stone. Of 100 cases in which the obstruction was due to causes other than stone, in ninety-two cases there was dilatation of the gall bladder; in eight cases there was a normal gall bladder, or an atrophy of the gall bladder. Of eighty-seven cases in which the obstruction was due to stone, in seventy cases the gall bladder was small and atrophied; in seventeen cases the gall bladder was dilated.

All these cases were collected from post-mortem records. Of the cases that had been submitted to operation, thirty-five in number, in eighteen the obstruction was due to causes other than stone, and in sixteen of these there was dilatation of the gall bladder; in seventeen the obstruction was due to stone, and in thirteen of these the gall bladder was contracted.

These facts were summarised by Courvoisier, and may be embodied as a "law" in the following statement:—

"In cases of chronic jaundice due to obstruction of the common bile duct, a contraction of the gall bladder signifies that the obstruction is due to stone; a dilatation of the gall bladder, that the obstruction is due to causes other than stone."

Independent confirmation of this law was made by Terrier, and by Mayo Robson; subsequent writers, without exception, have corroborated it, and have quoted exemplary instances of its accuracy.

Ecklin, in 172 cases of common duct obstruction, due to calculus, found that twenty-eight, or 16 per cent., had dilatation of the gall bladder; 144, or 84 per cent., had contraction of the gall bladder. In 139 cases of obstruction due to other causes, 121, or 87 per cent., had dilatation of the gall bladder.

A further examination of the question has been made by Dr. A. Cabot of Boston, who collected the records of the Massachusetts Hospital for a series of years. There were eighty-six cases of obstruction of the common duct. Of these, fifty-seven were due to obstruction by stone; in forty-seven the gall bladder was atrophied, in eight it was normal, and in two enlarged. Twenty-nine cases were due to causes other than stone; in twenty-seven the gall bladder was distended; in one the gall bladder was empty, and in one contracted around three stones. Only four cases, therefore, in this series did not fall in with Courvoisier's law. Cabot writes: "With the exception of these four cases, which constitute only 5 per cent. of the total number examined, every record of the Massachusetts Hospital series, in which definite statements are to be found concerning the points at issue, goes to confirm Courvoisier's law."

The explanation given originally by Courvoisier of the occurrence of the sclerosis of the gall bladder in cases of calculous obstruction of the duct was, that stones had been present in the gall bladder for long periods, that their presence there had caused recurring attacks of cholecystitis, and that, as a result, the gall bladder walls had become thickened and fibrous. The gall bladder, so affected, became by degrees more and more shrunken, and at the last was represented by a shrivelled mass of fibrous tissue, its cavity was greatly reduced in size, or almost obliterated, and the surrounding dense adhesions hid it from sight. Oft repeated attacks of cholecystitis and peritonitis resulted in the cicatricial compression and cramping of the gall bladder. Distension of such a gall bladder is, of course, mechanically impossible.

Fenger, criticising this statement, offers the explanation that "the atrophy in these cases, hitherto incomprehensible, is easily explained by the ball-valve action of a floating choledochus stone at the distal end of the cystic duct." This, however, leaves out of consideration the numerous cases where the stone is not found at the spot mentioned. Elsewhere Fenger attributes the emptiness of the gall bladder to a floating stone "in or near the cystic duct."

The great probability is that the explanation of Courvoisier is entirely correct. The sclerosis (it is not merely an "atrophy," as Fenger says) of the gall bladder is a matter of old standing, and is present long before the impaction of the stone. Fenger's explanation would account for the emptiness of the gall bladder in a few cases, but not for the cicatricial contraction present in the great majority.

In cases of obstruction of the common duct, when the jaundice is persistent and unvarying, when it does not "ebb and flow," a dilatation of the gall bladder very strongly suggests a diagnosis of malignant disease, probably in the head of the pancreas, but possibly in the common bile duct itself. But the association of chronic jaundice and enlargement of the gall bladder does not always mean that cancer is present or that stone is absent. The "law" may be infringed, sometimes flagrantly, as Courvoisier himself was the first to assert.

In the great majority of the cases that have come under my own observation, Courvoisier's law has proved to be correct. Some of these cases have been submitted to operation, and the diagnosis verified in that way, but many of them, after the opinion has been expressed that malignant disease was present, have been deliberately left without operation; the subsequent clinical course and post-mortem examination have shown that the diagnosis was accurate.

To achieve an accurate diagnosis in cases of chronic obstructive jaundice is of the first importance, for if the disease is simple, an operation will cure the patient; if the disease is malignant, the operation in itself is productive of great harm, and no possible benefit can be expected from it. But little attention has been given to the conditions which are disclosed when there is an infraction of Courvoisier's law. Several cases have come under my own care in which chronic jaundice and distension of the gall bladder have been associated, in the absence of malignant disease, and at least two in which cancer of the head of the pancreas was found at operation, and subsequently verified by microscopic examination when no distension of the gall bladder was present. In one case I have operated for carcinoma of the common bile duct, the gall bladder being sclerosed.

Courvoisier calls attention (p. 59) to several cases in which hydrops or empyema of the gall bladder due to stone in the cystic duct, or to stenosis of the duct, was present when there was calculous obstruction of the common duct.

The following are brief extracts from the notes of some cases under my care in which there was a transgression of Courvoisier's "law."

Group 1.—Cases of chronic obstructive jaundice associated with distension of the gall bladder, in the absence of malignant disease.

CASE 1.—*Empyema of the gall bladder due to impaction of a stone in the cystic duct; obstructive jaundice due to stone in the common duct.*—The patient was a woman, æt. 58, who for many years had suffered from attacks of "spasms," which, since her child-bearing period, had been very much less severe than they were previously. In April 1904 there were a series of attacks of severe pain in the right hypochondrium, two of which were followed by transient jaundice. In September 1904 she became deeply jaundiced, and from that time up to April 1905 the jaundice had varied very little from time to time. Ten days before her admission to the Infirmary in April 1905 she had a rigor, a temperature of 104°·2, and a swelling was then first noticed in the abdomen.

On admission the patient was deeply jaundiced. Her temperature varied between 98° and 100° in the morning, and between 100° and 102° at night. During seven days when she was under observation, the jaundice did not vary in the least. There was pain in the right hypochondrium, and on examination a large ovoid mass could be felt. It was smooth and tender, and was recognised as a distended gall bladder. On the ninth day after admission a rigor occurred; the abdomen became full and tender. Operation was undertaken, an empyema of the gall bladder found, due to a stone impacted in the cystic duct. In the third part of the common duct a stone as large as a pigeon's egg was felt. It was pushed backwards in the first part of the duct and removed. The gall bladder was drained, the stone in the cystic duct being easily dislodged. The patient recovered.

CASE 2.—*Hydrops of the gall bladder; obstructive jaundice due to many stones impacted in the common duct.*—A lady, æt. 48, had suffered from jaundice for fifteen months. The jaundice had come on without pain, and had not varied after the first month. After nine months of jaundice the opinion was expressed by a distinguished physician that there was malignant disease of the pancreas, for examination disclosed a distended gall bladder. A fortnight before I saw her in January 1906, there had been a sharp attack of pain in the upper part of the abdomen, followed by a temperature of 102°. The jaundice did not vary.

There had been in this case, therefore, jaundice of fifteen months' duration, no variation in the depth of colour, and evident enlargement of the gall bladder. The duration of the disease and the absence of pronounced wasting prompted me to suggest that the common duct was probably full of stones, and the exploration, at least, was desirable. On opening the abdomen, I found an old hydrops of the gall bladder, probably of longer standing than the jaundice, and a complete impaction of the common and hepatic ducts by calculi and sand. There were thirty-six large stones in the common duct, all consisting of bilirubin calcium, and the intervals between them were filled up with a thick tenacious black mortar. The unvarying nature of the jaundice was at once explained. There had been a most effective barrier of masonry in the duct, and no drop of bile had been able to pass it.

Case 3.—*Stone in the cystic duct pressing upon the portal vein and the common bile duct.*—Patient was a woman, æt. 59. Her illness began suddenly six years ago with violent pain in right hypochondrium. The attack was one of typical gallstone colic, and was followed by jaundice. She had another attack two years ago, and a third one year ago, but apparently was not jaundiced. Two months ago her abdomen began to swell, and she became jaundiced. One month ago she was tapped, and 11 pints of dark fluid drawn off. On examination, there was marked jaundice with much ascites. The gall bladder formed a mobile rounded tumour, palpable opposite the tenth costal cartilage. Nine and a half pints of dark bilious fluid were drawn from the peritoneal cavity, but the abdomen rapidly refilled, and the patient died two days later.

Post-mortem.—Abdomen distended with about 6 pints of bloody fluid and clot. Gall bladder sausage-shaped, 4½ in. long and 2 in. broad, containing multitude of minute stones in clear mucus. Hepatic ducts markedly dilated. Half stone size of a medium-sized Barcelona nut. Common bile duct dilated; contained a few minute stones. The stone in the cystic duct pressed against the common duct, almost occluding it, the duct being dilated above the point of pressure. The stone also pressed upon the portal vein, there being a few adhesions between the cystic duct and the peritoneum over the portal vein. Both the common duct and portal vein were patent to the passage of a probe.

Cases similar to the above are related by M'Arthur[1] and Moore.

Case 4.—*Chronic pancreatitis; persistent jaundice; distension of the gall bladder.*—(The case now quoted is only one of several that I have seen illustrating the same points.) A lady, æt. 45, had suffered for twenty years from biliary colic. Seven years ago she became jaundiced, and has never been free from it since, though the colour has varied from time to time. During the last twelve months the tinge has got steadily deeper, and an enlargement of the gall bladder has been observed. There has been a loss of 2 stones in last three months. Operation, March 1904. The distended gall bladder, almost thrice its natural size, was full of black muddy material and bile. The common duct was dilated; it contained no stone, but much gritty material similar to that in the gall bladder; the head of the pancreas was very greatly enlarged. The gall bladder was emptied and drained for five weeks. The contents of the common duct were milked backwards into the gall bladder. In March 1906 the patient wrote to say she was quite well.

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[1] *Ann. Surg.*, Phila., vol. xxxv. p. 666.

Case 5.—*Deep jaundice; distension of the gall bladder and bile ducts by hydatid cysts.*—The patient, a woman æt. 51, was admitted to the Infirmary with a history of chronic unvarying jaundice, distension of the gall bladder, and enlargement of the liver, of five months' duration. Within a few days death occurred from acute mania. The patient was almost moribund when admitted, and a diagnosis of malignant disease of the head of the pancreas was made; no operation was possible on account of the patient's desperate state. At the post-mortem, a large hydatid cyst was found in the right lobe of the liver; it communicated with the gall bladder. The gall bladder, cystic and common ducts were as full as they could possibly be of small grape-like hydatid cysts.

Group 2.—Cases of chronic obstructive jaundice, without distension of the gall bladder, due to malignant disease.

Case 6.—Mrs. A., æt. 57, seen February 1905. For several years there had been attacks of "spasms"; the last attack was more than five years ago. In several of the attacks there was jaundice: on one occasion jaundice persisted for five months, during which she had many attacks of shivering and pain. After an exceptionally bad attack, she obtained relief from the jaundice, which had never returned until eleven weeks before I saw her. The present attack commenced gradually, with slight pain in the upper part of the abdomen. The jaundice gradually deepened, until the skin became a dark yellowish-green in colour. Wasting was rapid and extreme; in eleven weeks she had become very emaciated. There was occasionally a slight elevation of temperature; no rigors occurred, and the jaundice never lessened. The liver was slightly enlarged and readily palpable; the gall bladder could not be felt, but there was tenderness along the lower border of the liver. This was the history I obtained when I saw her in February 1905. I expressed an opinion that there was probably malignant disease in the common bile duct or in the head of the pancreas, and that the absence of distension of the gall bladder was due to the old attacks of cholecystitis. Three days after I first saw her, a rigor occurred, followed within a week by a second one. This seemed to make exploration desirable. On opening the abdomen, I found and removed a mass of cancer at the beginning of the common duct. The gall bladder was shrivelled, and its contracted cavity contained a little muddy mucous fluid. The patient died in a few hours.

This is the type of case in which one would expect to find a violation of Courvoisier's law. For it is probable that in cases of carcinoma of the common bile duct, as in carcinoma of the gall bladder, the development of the malignant change is secondary to prolonged gall-stone irritation. The inflammatory conditions set up by the gall stones in the gall bladder result in its conversion into a shapeless mass of fibrous tissue, incapable of distension.

Case 7.—*Chronic obstructive jaundice due to malignant disease of the head of the pancreas; no distension of the gall bladder.*—The patient was a man, æt. 73, who had suffered from stomach trouble "all his life." He was a querulous neurotic individual. Three and a half months before I saw him he had become jaundiced, gradually and painlessly. Wasting soon became pronounced, and vomiting almost continuous. There was no fulness of the gall bladder. A mass was palpable just above the umbilicus and a little to the right; the stomach was dilated, and waves of contraction were seen to pass constantly over it. The patient had been seized a few hours before I saw him with acute pain and collapse. A diagnosis of perforation of a malignant growth in the stomach was made, and I saw him to advise upon the question of operative treatment, and expressed a decided opinion against any such measure. The patient died a few hours after I saw him. At the post-mortem, a large internal hæmorrhage was found, the origin of which could not be discovered. There was malignant disease of the head of the pancreas. The gall bladder was free from adhesions or obvious disease, and was of normal size.

Other illustrative cases could be quoted, but evidence enough has been adduced to show that Courvoisier's law, like all other laws, is capable of infraction.

The following may be stated as the chief circumstances in which the law may be violated:—

1. Where there is a stone or a stricture in the cystic duct causing hydrops or empyema, together with the acute impaction of a stone in the common duct.
2. Where there is a stone in the cystic duct pressing upon the common duct.
3. Where there is distension of the gall bladder by an acute inflammatory process, with obstruction of the common duct by stone.
4. Where there is chronic induration of the head of the pancreas, with a stone in the common duct.
5. Where there is malignant disease of the common duct at any part of its course, or cancer of the head of the pancreas, and a chronic sclerosing cholecystitis.

After making full allowance for all these conditions, it cannot be denied that the validity of the law is established in at least 90 per cent. of the cases met with in practice. In the remaining 10 per cent. there is rarely a difficulty in diagnosis when the other symptoms are passed in review.

OCCUPATION MORTALITIES.[1]

By JAMES C. DUNLOP, M.D., F.R.C.P. Ed., *Superintendent of the Statistical Department in the Office of the Registrar-General for Scotland.*

THE detail of the study to which I desire to draw the attention of the Society is published in the Decennial Supplement to the Forty-eighth Detailed Annual Report of the Registrar-General for Scotland. It is based on the number of male persons found by the 1901 census to be engaged in the various occupations, and on the number of deaths registered in Scotland during the years 1900, 1901, and 1902. The reason why the deaths of three years were used for this purpose was to make the field of observation as large as possible, while more than three years could not be used, because census returns for this purpose are not a reasonably accurate guide for a longer period. But even using three years, it was found that the number of deaths in some occupations was so small as to be worthless in such a study, and consequently not all occupations were included, but only those occupations or groups of occupations were included which might be expected to give results of some value.

The mortality, or death-rate, prevailing in the various occupations of the male section of communities is a matter which has been previously studied on a large scale on at least eight occasions. Of them one was in Scotland—it was published in the Supplement to the Thirty-eighth Detailed Annual Report of the Registrar-General; four were English studies, and were published in Supplements to the Twenty-fifth, Thirty-fifth, Forty-fifth, and Fifty-fifth Annual Reports of the Registrar-General of England and Wales; two were Parisian studies—they were published in "Annuaire Statistiques de la Ville de Paris for the years 1889 and 1895"; the eighth was a Swiss study, and was published in a report issued by the Swiss Statistical Bureau dealing with the causes of death during the years 1871 to 1890.

In making these studies, there are two statistical difficulties, or sources of error—the one is the difficulty of making reasonable comparison between somewhat dissimilar quantities, the other is the want of numbers sufficiently large to enable rates to be stated with certainty. The former difficulty is dependent on the varying age distribution in the various occupations, the latter on the limited numbers engaged in the occupations. Methods for overcoming the former difficulty have been devised and used in previous studies, but, so far as I am aware, in previous studies there has been no endeavour to systematically allow for probable error arising from paucity of observations. Before describing the method of tabulation which I have adopted, I shall briefly describe those previously used.

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[1] Communicated to the Edinburgh Medico-Chirurgical Society on March 7, 1906.

In the Swiss study the method of tabulation used was to arrange the various occupations in order of magnitude of death-rate in each of four age periods, and class those occupations as subject to low mortality which were found to be near the top of such tabular statements, and those occupations as subject to high mortality which were low in such tabular statements. Thus agriculture is found to be fourth in the list in three age periods and second in one age period, and is included among those occupations subject to low mortality; while painters and decorators are found near the foot of the list in all age periods, and are described as subject to high mortality.

In the Parisian studies, or more accurately in a paper read by the author of the Parisian studies at the seventh International Congress of Hygiene and Demography, a graphic method was used. This consisted in the representation of the death-rates of all males in the age periods by a curve in a diagram, while a superimposed curve represented the death-rates of the occupation under consideration, the difference between the two curves showing the difference between the mortality of the occupation and that of all males. This method has the advantage of showing differences at a glance and concisely.

In the English studies and in the previous Scottish study a method of tabulation by means of a comparative mortality figure was used. The comparative mortality figure was arrived at in this manner. The first step was to find the number of all males in the age periods under study which when subject to the recorded death-rates of all males would yield exactly 1000 deaths. Having that number, it was then divided proportionally into the numbers in the different age periods, and having those numbers apply to them the death-rates found in the occupations, the calculated number of such deaths being the comparative mortality figure. Thus in the previous Scottish study it was found that there were 36,201 deaths among 748,965 males of between 25 and 65. From that it was calculated that there would be 1000 deaths among 62,067 males of those ages; and that of the 62,067 persons, 40,208 would be between 25 and 45 years old, and 21,859 between 45 and 65. Applying the death-rates of the two age periods found in the clerical profession to these populations (40,208 and 21,859), it was found that in all 581 deaths would result. That number is the comparative mortality figure, and indicates that were the death-rates among the clerical profession common to all males, there would have been only 581 deaths instead of each 1000 deaths. This method has advantages—the calculations are simple, the difficulties of fair comparison are overcome, and the results are concise and definite. But this method, like those mentioned above, assumes that the rates found indicate the true death risks, and makes no allowance for probable errors.

The method which I have adopted in this study was suggested to me by Professor Karl Pearson. It consists of ascertaining the amount of probable error, and loading the ascertained rates with those errors. The probable error per unit is calculated by this formula, $\frac{0{\cdot}67449}{N}\sqrt{\frac{m.n}{N}}$, and the amount of variation thus found is expressed with each rate thus—rate ± probable error.[1] Having ascertained the rates and the amount of variation, only those rates are taken as decidedly different whose difference is at least three times the amount of the combined probable errors. Thus the death-rates among ministers, clergymen, and priests in the 25 to 45 age period is found to be 3·88±0·44, that of all males in that age period 9·32±0·05. The difference between the crude rates is 5·44, the amount of three times the probable errors is only 1·47, and therefore the death-rate of the clerical profession in that age period is taken as decidedly less than the corresponding death-rate of all males. On the other hand, the death-rate of fishermen in the same age period is found to be 8·75±0·32; this rate is not taken as decidedly different from the corresponding rate of all males, because the crude difference between the crude death-rates, 0·57, is less than three times the amount of the combined probable errors, 1·17.

Unfortunately the use of this new method prevents a simple and comprehensive comparison of results such as is got when comparative mortality figures are used and a new method of comparison is required. The one I have adopted is to divide the occupations according to whether the death-rates in one or both of two age periods are smaller, greater, or not decidedly different from the corresponding death-rates of all males. By this means the occupations are divided into six classes, and if an occupation occurs in a class with low death-rates, it is held to be one with a low mortality, while if it occurs in a class with high death-rates, it is held to be an occupation with high death-rates. This method has not the nicety of that in which comparative mortality figures are used, but it has, I think, the advantage of not over-estimating the value of the observations.

The classification adopted is as follows:—

Class 1.—Occupations with death-rates less than the corresponding death-rates of all males in both age periods.

Class 2.—Occupations with a death-rate in one age period less than that of all males, but in the other age period a death-rate not decidedly different from that of all males.

Class 3.—Occupations with death-rates in both age periods not decidedly different from the corresponding death-rates of all males.

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[1] In the appended table the plus or minus probable error is shown by the figures in parentheses.

Class 4.—Occupations with a death-rate lower than that of all males in one age period, while that of the other age period is greater than the corresponding rate of all males.

Class 5.—Occupations in which there is a high death-rate in one age period, and in the other a death-rate not decidedly different from that of all males.

Class 6.—Occupations in which the death-rates in both age periods are greater than the corresponding death-rates of all males.

Occupations in Class 1 may be taken as those with the lowest mortality, those in Class 6 as those with the highest mortality, those in Classes 3 and 4 as having a mortality little, if any, differing from that of all males, and occupations in Classes 2 and 5 as having a mortality intermediate between the average and the extremes.

A great objection to the introduction of a new method of tabulation is that comparison with previous work is rendered less simple; but, notwithstanding that objection, I have thought it right to introduce this new method rather than use one which may overestimate the accuracy of the results of the study.

Professions.—Among the professions, four are included among the selected occupations. These are the clerical, including ministers, clergymen, and priests; the legal, including advocates and solicitors; the medical, including physicians, surgeons, and dentists; and the teaching, which includes schoolmasters, teachers, professors, and lecturers. If these four are considered together, they are found to be in Class 1, and to have in both age periods a death-rate decidedly less than those of all males of the same ages; but if considered separately, it is found that the clerical profession is the only one in Class 1, the legal and teaching professions being in Class 2, and the medical in Class 3. The previous Scottish and English studies agree with this result, in that in them it was found that the clerical profession was the healthiest of the four and the medical the least healthy. The results of the continental studies, however, did not agree with the clerical not being in all cases the healthiest, nor the medical the least healthy.

Farming and allied occupations.—Five such occupations are included among the selected ones. These are farmers and graziers, agricultural labourers and farm servants, gardeners, nurserymen, and seedsmen, shepherds, and gamekeepers. These occupations, when considered both collectively and separately, are found to be in Class 1, to have low death-rates in both age periods, and consequently to be exceptionally healthy occupations. The results of previous studies so far as comparable agree with this result.

Fishermen.—This is the only nautical occupation included among those selected for this study. It is found to be in Class 2, having a death-rate not decidedly different from the average in the earlier age period, but a low death-rate in the older age period.

In the previous Scottish and English studies the mortality figure was found to be low.

Horsemen.—Among the selected occupations there are two concerned with the care and use of horses—the one includes coachmen, grooms, and cabmen, the other carters, carriers, and vanmen. Collectively these occupations are in Class 6. Considered singly, the former is found to be in Class 6, having high death-rates in both age periods, and the latter in Class 5, having a high death-rate over 45, but a death-rate under 45 not decidedly different from the average. Results of previous studies, so far as they are comparable, agree with this.

Commercial travellers.—This occupation is found to be in Class 2, and to have a low death-rate in the younger age period, and in the older period one not decidedly different from the average. In the previous Scottish study the reverse was found, the younger death-rate was high, while the older one was low. In that study the comparative mortality figure was low. In the last two English studies the mortality figure was low. In the Paris study the death-rate in the earlier period was low, and that in the older period high.

Liquor trade.—Among the selected occupations there are three concerned with the liquor trade. These are—(1) Maltsters, brewers, and distillers; (2) hotelkeepers, publicans, and wine and spirit merchants; and (3) barmen and cellarmen. When considered collectively, these occupations are found to be in Class 6, and to have high death-rates in both age periods; but when considered separately, it is found that the first, maltsters, etc., are in Class 3, with death-rates not decidedly different from the average, while the other two, hotelkeepers, etc., and barmen, etc., are both in Class 6.

Domestic service.—There was only one occupation of this nature among those selected; it includes hotel and other domestic servants (male only; female occupations were not studied), and it was found to be in Class 3, with death-rates in both age periods not decidedly different from the average.

Clerks.—Three occupations of this nature were included among those selected. These are—law clerks, commercial and railway clerks, and bank and insurance service. These occupations collectively are found to be in Class 3, with death-rates not decidedly different from the average; but when considered separately, law clerks are found to be in Class 3, commercial and railway clerks in Class 5, their death-rate in the 25 to 45 age period being higher than that of all males: while bank and insurance service is found to be in Class 2, having a low death-rate in the 45 to 65 age period. In previous studies, law clerks were found to have high comparative mortality figures, a result not corroborated in this study. Owing to differences of selections of occupations, the results of previous studies regarding commercial and banking and insurance clerks are not readily available for comparison.

Chemists.—Among the selected occupations there is one which includes chemists, druggists, and manufacturing chemists, and it is found to be in Class 6, and to have high death-rates in both age periods. Owing to differences of classification of occupation, this result cannot be fairly compared with the results of previous studies.

Shopkeepers.—Five of the selected occupations are of this nature—grocers and provision merchants, drapers, linen-drapers and mercers, ironmongers and metal-dealers, coal merchants, and general shopkeepers. When the returns of the five are massed and considered collectively, it is found that the occupation of shopmen is healthy, for it is found that the death-rates in both age periods are low, and the group of occupations is in Class 1. When considered singly, grocers are found to be in Class 2, drapers in Class 1, ironmongers in Class 1, coal merchants in Class 3, and general shopkeepers in Class 2. The results of previous studies are similar, for in the Scottish and in each of the English these occupations were found to have low mortality figures.

Preparation and sale of food.—Five of the selected occupations belong to this group. They are dairymen and milk-sellers, fishmongers, poulterers and game-dealers, butchers and meat salesmen, millers, and bakers, confectioners, and biscuit makers. Collectively, this group of occupations is found to be in Class 5, having a death-rate in the 25 to 45 age period not decidedly different from the average, but one in the 45 to 65 age period higher than the average. Considered separately, dairymen are found to be in Class 3, fishmongers in Class 3, butchers in Class 3, millers in Class 2, with a low death-rate in the younger age period, and bakers in Class 4, with a low death-rate in the younger period, but a high one in the older period. The results of previous studies, so far as available, generally agree with those results, except those regarding butchers, for in each of the English studies, and in the previous Scottish study, that occupation was found to have a high mortality figure, and high death-rates among butchers were also found in the Swiss study; but in the Parisian studies, however, no excessive death-rates among butchers were found.

Hairdressers.—This occupation is found to be in Class 6, and to have high death-rates in both age periods, results which agree with those of all previous studies.

Tailors and clothiers.—This occupation is also found to be in Class 6, with high death-rates in both age periods. High mortality figures for this occupation were found in the previous Scottish study and in the second and third English studies, and high death-rates were found in the Swiss study, but a low mortality figure was found in the fourth English study, and low death-rates in the Parisian studies. These results are somewhat contradictory.

Leather workers.—Three occupations of this nature are among the selected ones. These are boot and shoe makers and dealers, skinners, tanners, and curriers, and saddlers and harness and whip makers. Collectively, these three occupations are found to be in Class 3, with death-rates in both age periods not decidedly different from the average. Individually, skinners, etc., and tanners, etc., are also found to be in Class 3; but bootmakers, etc., are found to be in Class 5, as the rate among them in the older period is high. In the previous Scottish study, bootmakers were found to have a high mortality figure, while skinners and saddlers had a low one. In the English studies, bootmakers had a low mortality figure, but saddlers a high one in one instance and a low in two instances. In the Parisian studies, bootmakers and saddlers were found to have high death-rates, while skinners had low death-rates. In the Swiss study, saddlers had high death-rates, and bootmakers a low one in the younger age period and a high one in the older age period. The results of this and previous studies are thus not altogether in agreement.

Printers.—The occupation of printer and lithographer is found to be in Class 3, a result in general agreement with those of the last two English studies and the previous Scottish study, but in disagreement with the result of the first Parisian study, when this occupation was found to have high death-rates in both age periods.

Watchmakers.—The occupations of watchmakers and jewellers is also found to be in Class 3, a result closely agreeing with those of the last English and the previous Scottish studies.

Paper manufacture.—The occupation of papermaker is found to be one with low death-rates in both age periods, and to be in Class 1. This agrees with the results of the previous Scottish study and those of the English studies.

Brick, cement, pottery, and glass manufacture.—This group of occupations is found to be in Class 3, and to have in both age periods a death-rate not decidedly different from the average. Results of previous studies are not available for purposes of comparison.

Textile manufacture.—There are four of the selected occupations which are of this nature—cotton flax and linen manufacture, wool and worsted manufacture, textile-bleachers printers dyers and calenderers, and jute manufacturers. These four together are found to be in Class 1, with death-rates in both age periods less than the average. Separately, the cotton, wool, and jute manufacturers are also found to be in Class 1, while the bleachers and dyers are in Class 4, with a low mortality in the younger age period, and a high mortality in the older age period. The results of previous studies regarding cotton manufactures are contradictory, for in the previous Scottish study the mortality figure was found to be slightly low, while in the last two English studies it was somewhat high. Woollen manufacture in the last Scottish study was found to have a very low mortality figure; in the last two English studies the mortality figure was very little different from the average. Bleachers and dyers were found in the previous Scottish study to have a high mortality figure, as was also the case in each of the English studies, but in the Swiss study the death-rates of that occupation were found to be low. Jute manufacture in the previous Scottish study was found to have a high mortality figure. These results are in several instances contradictory. Excluding the bleachers and dyers from the group, it is found that these textile manufactures are subject to a decidedly low death-rate in both age periods.

Building trades.—Eight of these occupations are among those selected. These are builders masons and bricklayers, slaters and tilers, plasterers, plumbers and gasfitters, painters paperhangers and glaziers, cabinetmakers French polishers and upholsterers, carpenters and joiners, and sawyers. When considered collectively, these occupations are found to be in Class 3, and to have death-rates in both age periods closely approximating to those of all males. When considered separately, it is found that carpenters and joiners are in Class 1, with low death-rates in both age periods; plumbers and gasfitters and sawyers are both in Class 2, with a low death-rate in the younger age periods, and death-rates not decidedly different from the average in the older age period; slaters and tilers, plasterers, cabinetmakers French polishers and upholsterers are each in Class 3, with death-rates in both age periods not decidedly different from the average; painters paperhangers and glaziers are in Class 5, with a high death-rate in the older age period, and one not decidedly different from the average in the younger age period; while builders masons and bricklayers are in Class 6, with high death-rates in both age periods. Builders, etc., in the last Scottish study were found to have a high mortality figure, but the results in the English, Parisian, and Swiss studies did not show that result uniformly. Slaters and tilers have, with the exception of the English 1881 study, in each previous study been found to be subject to high death-rates. In the previous Scottish study plasterers were found to have death-rates little different from the average. Plumbers and glaziers were in the previous Scottish study found to have a low mortality figure. Painters in those previous studies which are comparable to this were found to have high death-rates. Cabinetmakers, etc., carpenters, etc., and sawyers have in previous studies been found to have low mortality figures and low death-rates. Thus regarding the building trades the results of the present study generally agree with those of the previous studies.

Coopers.—The occupation of cooper is found to be in Class 2, with a low death-rate in the younger age period, and a death-rate not decidedly different from the average in the older age period.

In the previous Scottish study a very similar result was found. In the Parisian and Swiss studies this occupation was found to have high death-rates.

Cycle, motor, carriage and waggon makers.—This occupation is also found to be in Class 2, with a low death-rate in the younger period, and one not decidedly different from the average in the older period. Very similar results were found in the previous Scottish and English studies.

Shipwrights, ship and boat builders.—This occupation is found to be in Class 1, and to have in both age periods death-rates decidedly less than those of all males. In the previous Scottish and in the English studies similar results were found.

Iron manufacture.—Five of the selected occupations are connected with iron manufacture. These are—iron and steel manufacturers and ironfounders, blacksmiths and strikers, engine and machine makers, boilermakers, erectors fitters and turners. Considered collectively, these occupations are found to be in Class 5, with a death-rate under 45 not decidedly different from that of all males, and a death-rate over 45 greater than that of all males. When considered separately, it is found that erectors and fitters are in Class 1, with low death-rates in both age periods; blacksmiths and strikers are in Class 2, with a low death-rate under 45, and an average one over 45; engine and machine makers, and iron and steel manufacturers and ironfounders are both in Class 5, with an average death-rate in the younger age period, and a high one in the older age period; while boilermakers are found to be in Class 6, with high death-rates in both age periods. Previous studies, so far as comparable, are somewhat contradictory; for instance, in the last English study, ironfounders were found to have the highest mortality of this group, while boilermakers had a mortality figure of less than the average amount. In the previous Scottish study boilermakers were found to have the highest mortality figure of the group, while engine and machine makers had the lowest.

Tinplate goods makers.—This occupation is found to be in Class 3, and to have death-rates in both age periods not decidedly different from those of all males, a result generally corroborated by previous studies.

Brassfounders, finishers, workers.—This occupation is also found to be in Class 3, with average death-rates in both age periods. With that result the previous Scottish study agrees.

Miners and quarriers.—Three of the selected occupations belong to this group: they are coal and shale miners, ironstone miners, and stone quarriers and dressers. When considered collectively, these occupations are found to be in Class 4, with a low death-rate under 45, and a high death-rate over 45. When considered separately, it is found that both coal and shale miners and ironstone miners are in Class 4, with a low death-rate under 45, and a high death-rate over 45; while stone quarriers and dressers are in Class 3, with death-rates in both age periods not decidedly different from those of all males. The results of previous studies are contradictory. In the last Scottish study, quarriers were found to be the healthiest of the group, and ironstone miners decidedly the least healthy, while coal and shale miners were intermediate. In the English studies, ironstone miners were found to have decidedly small comparative mortality figures and quarriers high ones.

Engine-drivers, stokers, firemen (not railway, marine, or agricultural).—This occupation is found to be in Class 2, with a low death-rate under 45, and one not decidedly different from that of all males in the older age period. In the previous Scottish and in the last English studies this occupation was found to have low comparative mortality figures.

Railway service (except clerks).—Railway service is found to be an occupation in Class 1, and to have in both age periods death-rates decidedly less than the corresponding rates of all males. A similar result was found in the previous Scottish study.

Messengers, porters, watchmen.—These occupations are found to be in Class 6, and to have death-rates in both age periods greater than those of all males. Similar results were found in the previous studies.

Hawkers, street-sellers.—These occupations are also found to be in Class 6, with high death-rates in both age periods. In the previous Scottish study and in each of the English studies high mortality figures were always found.

Dock labourers.—This occupation is found to be in Class 3, with death-rates in both age periods not decidedly different from those of all males. In the previous Scottish study this occupation was found to have a high comparative mortality figure; the results of the English studies are not available for purposes of comparison.

General labourers.—This occupation in this as in previous studies is found to be subject to high death-rates, and therefore in Class 6.

I append a tabular statement showing the selected occupations arranged in classes, the death-rates with their probable errors of each of those occupations, and an indication of those occupations in which certain selected causes of death are found to be decidedly more or decidedly less prevalent.

TABLE *showing Occupations arranged in Classes according to amount of Death-Rates, and also showing in which Occupations decidedly high or low Death-Rates from certain causes of death are found.*

Rates against each occupation show death-rates per thousand in 25 to 45 and 45 to 65 age periods.

+ indicates death-rate is greater than that of all males.

− indicates that death-rate is less than that of all males.

0 indicates that death-rate is not decidedly different from that of all males.

Signs in parentheses against each class indicate death-rates in two age periods studied, namely, 25 to 45, and 45 to 65.

OCCUPATION.	Tubercle.	Malignant Disease.	Pneumonia.	Bronchitis.	Violence.
All males, 9·32 (0·05),[1] 26·82 (0·11)	...	...	...	...	...
CLASS 1 (− · −).					
Ministers, clergymen, priests, 3·88 (0·44), 17·03 (1·08)	−	...	−	...	−
Farmers, graziers, 4·99 (0·20), 15·89 (0·33)	−	+	−	−	−
Agricultural labourers, farm servants, 4·64 (0·17), 16·48 (0·48)	−	...	−	−	−
Gardeners, nurserymen, seedsmen, florists, 6·07 (0·36), 18·35 (0·70)	−	...	−	...	...
Shepherds, 6·48 (0·50), 13·61 (0·86)	−	...	−	−	−
Gamekeepers, 3·34 (0·40), 14·26 (1·18)	−	...	−	−	−
Drapers, linen drapers, mercers, 7·50 (0·49), 21·09 (1·23)	...	...	−	...	−
Paper manufacture, 5·27 (0·64). 20·03 (1·67)	...	...	−	...	...
Cotton, flax, and linen manufacture, 6·61 (0·61), 22·70 (1·29)	...	...	...	+	−
Wool and worsted manufacture, 3·40 (0·39), 17·21 (1·07)	−	...	−	...	−
Jute manufacture, 6·35 (0·56), 18·14 (1·31)	−	...	...	...	−
Carpenters, joiners, 7·62 (0·19), 21·03 (0·58)	...	...	...	−	−
Shipwrights, ship and boat builders, 7·36 (0·27), 21·54 (0·68)	−	...	−	...	...
Erectors, fitters, turners (engine and machine), 8·08 (0·33), 21·57 (0·84)	−	...	...	−	−
Railway service (except clerks), 8·43 (0·28), 22·04 (0·67)	−	−	...	−	+
CLASS 2 (0· − or − ·0).					
Fishermen, 8·75 (0·32), 17·23 (0·61)	...	...	−	−	+
Bank and insurance service, 8·47 (0·52), 21·99 (1·22)	...	...	−	−	−
Ironmongers, metal merchants, 8·44 (0·81), 19·87 (1·73)	...	...	...	...	...
General shopkeepers, dealers, 12·14 (1·23), 17·32 (1·83)	...	...	...	...	...
Advocates, solicitors, 6·05 (0·61), 25·49 (1·90)	−	...	−	...	−
Schoolmasters, teachers, professors, lecturers, 5·96 (0·48), 23·19 (1·40)	−	...	−	−	−
Commercial travellers, 7·39 (0·44), 27·07 (1·39)	...	...	...	...	−

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[1] The figures in parentheses indicate the plus or minus possible error.

OCCUPATION.	Tubercle.	Malignant Disease.	Pneumonia.	Bronchitis.	Violence.
Grocers, provision merchants, 7·80 (0·35), 25·73 (1·01)	–	...	–	–	–
Millers, 5·77 (0·83), 30·23 (2·25)	...	...	...	...	...
Plumbers, gas-fitters, 7·69 (0·51), 24·95 (1·54)	...	...	...	–	–
Sawyers, 7·24 (0·64), 23·02 (1·62)	...	...	...	...	...
Coopers, 6·23 (0·64), 27·10 (1·74)	...	...	...	...	–
Carriage, waggon, motor, cycle makers, 7·28 (0·60), 23·71 (1·58)	...	...	–	...	–
Blacksmiths, strikers, 7·56 (0·34), 27·28 (0·80)	...	...	...	+	...
Engine-drivers, stokers, firemen (not railway, marine, or agricultural), 7·65 (0·36), 24·78 (0·90)	–	...	...	–	+
CLASS 3 (0·0).					
Physicians, surgeons, dentists, 9·66 (0·82), 27·36 (2·16)	...	...	...	...	...
Maltsters, brewers, distillers, 7·83 (0·67), 23·83 (1·75)	...	...	...	...	...
Hotel and other domestic servants, 9·88 (0·77), 24·12 (2·27)	...	...	...	+	...
Law clerks, 8·57 (0·85), 26·63 (3·41)	...	...	...	...	...
Coal merchants, 9·56 (0·98), 27·64 (1·86)	...	...	...	...	...
Dairymen, milksellers, 8·36 (0·98), 23·51 (1·91)	...	...	...	...	...
Fishmongers, poulterers, game-dealers, 11·59 (1·28), 29·99 (2·76)	...	...	...	...	–
Butchers, meat salesmen, 10·22 (0·57), 26·64 (1·58)	...	...	...	–	–
Skinners, tanners, curriers, 7·24 (0·82), 24·93 (2·83)	...	...	...	...	...
Saddlers, harness and whip makers, 8·06 (1·18), 27·32 (2·87)	...	...	...	...	...
Printers, lithographers, 10·52 (0·55), 31·58 (1·59)	+	...	...	–	–
Watchmakers, jewellers, 9·65 (0·90), 23·53 (2·02)	...	...	...	...	...
Brick, cement, pottery, and glass manufacture, 9·27 (0·62), 29·87 (1·65)	...	...	+	...	...
Slaters, tilers, 9·81 (0·75), 25·00 (1·56)	...	...	...	...	...
Plasterers, 9·86 (0·78), 22·36 (1·72)	...	...	...	...	...
Cabinet-makers, French polishers, upholsterers, 8·88 (0·57), 25·13 (1·33)	...	...	...	...	–
Tinplate goods makers, 8·77 (0·88), 27·86 (2·41)	...	...	...	...	...
Brass-founders, finishers, workers, 9·34 (0·78), 24·14 (1·82)	...	...	...	...	–
Stone quarriers and dressers, 8·45 (0·45), 25·02 (1·08)	+	...	...	...	+
Dock labourers, 10·93 (0·57), 28·83 (1·22)	...	...	+	...	+
CLASS 4 (+·– or –·+).					
Bakers, confectioners, biscuit makers, 7·99 (0·37), 32·12 (1·14)	...	...	...	...	–
Coal and shale miners, 7·13 (0·15), 30·22 (0·53)	–	–	...	...	+
Ironstone miners, 6·47 (0·93), 41·16 (3·48)	–	...	...	+	...
CLASS 5 (+·0 or 0·+).					
Carters, carriers, vanmen, 8·90 (0·27), 29·89 (0·83)	–	...	+	...	+
Commercial clerks (including railway clerks), 10·15 (0·30), 25·84 (0·81)	+	–	...	–	–
Boot and shoe makers, dealers, 10·71 (0·49), 32·61 (0·93)	+	+	...	+	...

Occupation.	Tubercle.	Malignant Disease.	Pneumonia.	Bronchitis.	Violence.
Textile bleachers, printers, dyers, calenderers, 9·89 (0·55), 32·44 (1·34)	...	...	...	...	...
Painters, paperhangers, glaziers, 9·11 (0·45), 32·17 (1·30)	...	...	...	...	...
Iron and steel manufacture, 9·98 (0·26), 35·14 (0·79)	...	...	+	+	...
Engine and machine makers, 10·55 (0·48), 32·29 (1·27)	+	...	...	...	...
Class 6 (+ · +).					
Coachmen, cabmen, grooms, 12·52 (0·50), 33·19 (1·25)	+	+	+	...	...
Hotel-keepers, publicans, wine and spirit merchants, 17·66 (0·86), 42·31 (1·61)	+	+	+	...	...
Barmen, cellarmen, 18·76 (0·96), 51·83 (4·22)	+	...	+	...	...
Chemists, druggists, manufacturing chemists, 13·83 (1·02), 38·41 (2·10)	...	...	...	...	...
Hairdressers, 16·94 (1·30), 41·01 (4·34)	+	...	...	...	...
Tailors, clothiers, 10·82 (0·40), 32·32 (1·02)	+	...	...	...	–
Builders, masons, bricklayers, 11·47 (0·32), 33·48 (0·62)	+	...	+	+	...
Boiler-makers, 17·39 (0·77), 43·03 (1·80)	+	...	+	+	+
Messengers, porters, watchmen (not Government or railway), 16·30 (1·10), 47·86 (1·77)	+	+	+	+	+
Hawkers, street sellers, 16·59 (1·40), 52·27 (2·54)	+	+	+	+	...
General labourers, 18·05 (0·34), 55·77 (0·75)	+	+	+	+	+

THE CLINICAL SIGNIFICANCE OF THE CEREBRO-SPINAL FLUID.[1]

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In the adult, the spinal cord terminates at the level of the lower part of the first lumbar vertebra. Below that level, the arachnoidal sac extends as a hollow cavity as low down as the second sacral vertebra. There is thus a considerable extent of arachnoidal cavity devoid of spinal cord, occupied simply by the roots of the cauda equina and by the cerebro-spinal fluid which bathes them. From this region we can withdraw cerebro-spinal fluid without risk of injury to the spinal cord. In order to do so, we enter the cerebro-spinal pond from behind, somewhere between the laminæ of the second lumbar vertebra and the second sacral.

The two widest inter-laminal spaces are the one between the third and fourth, and the other between the fourth and fifth lumbar laminæ. Of these we usually select the space between the fourth and fifth laminæ, because, as a rule, it is a little larger. These two inter-laminal spaces are very easily found as follows:—We draw a horizontal line across the patient's back, at the level of the highest margin of the iliac crests. This line intersects the vertebral column at the top of the fourth lumbar spine. We make our puncture immediately below this spine.

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[1] A lecture delivered at the Medical Graduates' College and Polyclinic, London.

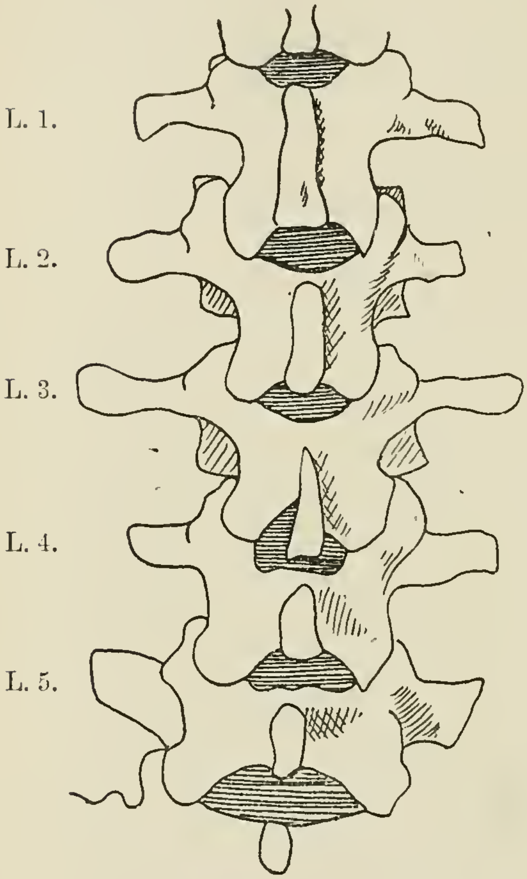

Fig. 1.—Inter-laminal Spaces in the Adult. (Chipault.)

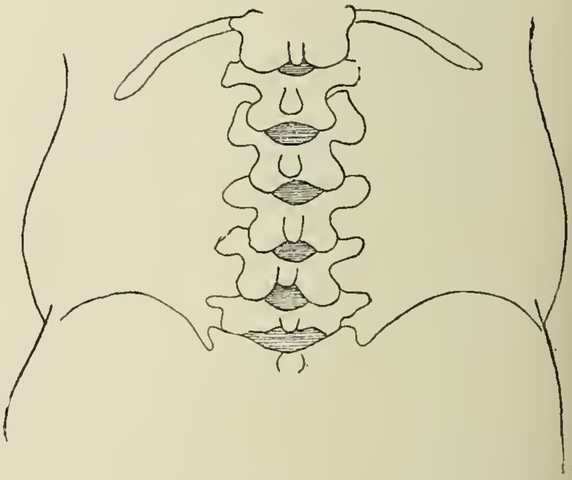

Fig. 2.—Inter-laminal Spaces in the Child. (Chipault.)

We use an all-glass syringe, which is readily sterilisable, on which to mount our needle. The needle itself is made of platinum and iridium, so that it can be boiled without rusting, unlike a steel needle. The needle must be long enough to reach into the arachnoidal sac, and yet short enough to stop short within the sac, without penetrating to the dura on the far side. For this purpose, the most convenient length of needle is about 8 cm., or just over 3 inches.

As to the patient's posture during the operation of "lumbar puncture," he may be lying on a bed or couch, in the left lateral position, with the knees and shoulders approximated. But it is better, if possible, to have him sitting on a low seat, stooping well forwards, with his knees separated, his arms hanging loose, and his hands touching the ground. In this way the laminæ are separated to their utmost extent.

We carefully sterilise the skin at the site of puncture, and render it anæsthetic by means of a spray of ethyl chloride. The operator places his left index finger on the fourth lumbar spine as a guide, and with his right hand pushes in the needle, about ½ in. below and to the right of this spot (so as to avoid the dense inter-spinous ligament), directing the point of the needle horizontally forwards and a little inwards. The ligamentum subflavum, deep in, between the laminæ, is somewhat resistant, and the needle is felt to be checked here. But we push firmly on, if no bone is struck, and suddenly the needle penetrates the ligament and dura-arachnoid, and is now in the arachnoidal sac. If we strike on a lamina instead of the ligament, we withdraw slightly and try a point above or below. Sometimes during the operation the patient feels a sudden, sharp pain shooting down his right thigh and leg. This simply means that our needle has touched one of the roots of the cauda equina *en route*, and is of no other significance. We now detach the syringe and allow the cerebro-spinal fluid to come out through the needle, collecting from 3 to 5 c.c. in a sterilised test tube. It is better not to employ suction by the syringe, unless some difficulty be experienced in getting the fluid to run. The pressure of the fluid as it escapes may be measured, if desired, by means of a rubber tube with a manometer attached. Normally the fluid trickles out slowly, drop by drop. The first few drops should be discarded, since they may be stained by the admixture of blood from our needle-wound of the superjacent tissues.

Occasionally it happens that even when we have successfully penetrated within the ligamentum subflavum, no fluid will flow. This is usually due to the blocking of the needle by a small plug of blood clot or shred of tissue, during the process of puncture. Or it may be due to the floating of one of the cauda equina roots up against the end of the needle. Such conditions are easily rectified by passing a sterilised stilette along the needle to clear it. Sometimes it happens that the needle pierces the ligamentum subflavum but pushes the spinal theca in front of it, so that, even though the stilette shows the needle to be free from obstruction, no fluid comes. In such cases it is best to withdraw the needle and puncture at the next space above.

Sometimes the intrathecal pressure is increased, so that the fluid escapes in a jet, instead of drop by drop. This occurs chiefly in intracranial tumours and in the various forms of meningitis, although even in these conditions an increased pressure of fluid in the lumbar region is by no means constant, for sometimes in meningitis there is occlusion of the foramen of Magendie, or of the foramina of Key and Retzius, cutting off the intraventricular from the spinal pond.

The fluid may be accidentally mixed with blood from the wounding of an arachnoidal vein during the puncture. This is an accident which cannot be foreseen. In most cases, such bleeding clears up after a few seconds, the fluid becoming progressively clearer and clearer. But admixture of blood also occurs in cases of pre-existent subarachnoidal hæmorrhage, cerebral or spinal, as in fracture of the skull, intraventricular hæmorrhage, or in trauma of the spinal cord. We can sometimes distinguish between hæmorrhage due to the local puncture and hæmorrhage which results from previous intrathecal lesions. We do this by centrifuging the fluid. In local hæmorrhage, due to our puncture, the blood corpuscles fall to the foot of the centrifuge tube, leaving the superjacent fluid clear and limpid ; whereas in a pre-existing cerebral or spinal hæmorrhage, the fluid (which during its flow was equally tinged from start to finish, and generally less deeply tinged than in local hæmorrhage) remains of a yellow colour even after centrifuging.

The withdrawal of a small quantity of cerebro-spinal fluid in most cases causes the patient no discomfort. But in a small proportion of cases he may complain of headache, coming on an hour or two later. This is usually in patients who have been walking about as usual after the puncture, and the headache can generally be prevented by recommending the patient to rest for a day or so, or at least to avoid physical exertion.

Normal cerebro-spinal fluid is colourless, like water. It has a specific gravity of 1006 to 1008. Chemically it contains a trace of serum globulin and albumose, and also a substance which reduces Fehling's solution, but which is not sugar. Microscopically it contains a few large, flat endothelial plates, and perhaps an occasional lymphocyte. It contains no organisms.

Having in this way obtained the cerebro-spinal fluid, what use are we to make of it? Its clinical applications may be classified into two groups—(1) Diagnostic ; (2) Therapeutic.

1. THE DIAGNOSTIC SIGNIFICANCE OF CEREBRO-SPINAL FLUID.—For diagnostic purposes, the fluid may be examined in various ways.

(1) *Physical characters.*—Instead of being clear and limpid, like water, the fluid may be turbid and cloudy, or even purulent, as in some cases of meningitis. In severe jaundice it has been observed to be yellow and clear, whilst in cases of hæmorrhage either into the brain or cord, as we have mentioned, it may be blood-stained.

In cases of sudden hemiplegia, we are sometimes in doubt whether the lesion is hæmorrhage or thrombosis. And the diagnosis between these two conditions may be very difficult. But the treatment of the two is diametrically opposite. In the case of thrombosis we stimulate, whilst in cerebral hæmorrhage we try to lower the blood pressure and diminish the force of the heart. If in a doubtful case we perform lumbar puncture and obtain blood-stained fluid, the diagnosis may be much simplified. I have performed lumbar puncture in a patient comatose from cerebral thrombosis, and obtained normal clear fluid; whilst in another patient with cerebral hæmorrhage the fluid was faintly straw-coloured, even after centrifuging. In traumatic cases it is of even greater value, in indicating the presence of meningeal hæmorrhage. Cathcart of Edinburgh[1] recorded a case in which, after a head injury, examination of the cerebro-spinal fluid helped to settle the diagnosis of intracranial hæmorrhage. He trephined, tied the ruptured artery, and saved the patient's life.

The freezing-point of the cerebro-spinal fluid has been studied by various observers—the so-called *cryoscopic examination*. Widal, Sicard, Ravaut,[2] and others have recorded a lowering of the freezing-point in certain diseases, such as meningitis, tuberculous or otherwise. But, on the whole, cryoscopy of the cerebro-spinal fluid has not been of great practical value.

(2) *Chemical characters*.—These are of some value. Thus, for example, an excess of albumin is found in acute meningitis. If fibrin is found, this is also pathological. Guillain and Paraut[3] recorded some interesting observations on the cerebro-spinal fluid in cases of general paralysis of the insane. When normal cerebro-spinal fluid is boiled, the albumin coagulates, and the fluid becomes slightly opalescent. If the globulin be precipitated by adding a saturated solution of magnesium sulphate, the fluid filtered, and the clear filtrate again boiled, it should remain clear. In general paralysis of the insane, however, the second boiling yielded a characteristic precipitate in every case out of a series of sixteen general paralytics examined by these observers.

Another chemical point, which my colleague Dr. Hebb investigated in a number of my cases at the Westminster Hospital, was as to the presence of cholin in the cerebro-spinal fluid. Normally cholin is not detectable in any appreciable quantity. But in organic degenerative diseases of the nervous system, cholin may be demonstrated in the blood and cerebro-spinal fluid, and can be crystallised out as a combined platinum salt, according to the method of Halliburton and Mott. Thus, for example, Dr. Hebb obtained cholin-platinum crystals from the cerebro-spinal fluid in cases of cerebral hæmorrhage, syringomyelia, disseminated sclerosis, etc. This test might occasionally be of value in the diagnosis between hysteria and gross organic disease, but it is somewhat too complicated and technical for the ordinary clinical observer.

(3) *Bacteriological characters*.—These are chiefly of value in cases of meningitis, to determine the particular organism causing

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[1] *Scot. Med. and Surg. Journ.*, Edinburgh, 1902, p. 145.

[2] *Compt. rend. Soc. de biol.*, Paris, 1900, August 20.

[3] *Rev. neurol.*, Paris, 1903, April 30.

the disease. Thus, for example, in epidemic cerebro-spinal meningitis, the meningococcus (*Diplococcus intracellularis*) is found; in tuberculous meningitis, the tubercle bacillus; and in other varieties of meningitis we may find staphylococci, streptococci, pneumococci, etc. But we should remember that failure to discover tubercle bacilli does not necessarily exclude tuberculous meningitis, though their presence would confirm such a diagnosis. Inoculation experiments on guinea-pigs are of value in doubtful cases.

(4) *Microscopic characters.*—Clinically, microscopic investigation has proved by far the most valuable mode of examination of the cerebro-spinal fluid. A good routine method is to centrifuge a given quantity of the fluid, say 5 c.c. for five minutes, so as to collect into a small deposit all the cellular elements which may be present. We then carefully decant off the superjacent fluid, turn the empty tube upside down, and scrape the bottom with a fine capillary pipette. In this way we collect the sediment, which is then transferred to a slide, fixed by heat, stained, say, by methyl blue or Jenner's stain, mounted in Canada balsam, and examined with the microscope.

In rare cases we may find parasites. Thus, for example, Castellani found the characteristic trypanosome of sleeping sickness, not only in the blood of such patients, but also in the cerebro-spinal fluid. This was so in every one of his thirty-two cases, and also in all of forty cases examined by Bruce.[1] In fact, it is easier to identify the trypanosome in the cerebro-spinal fluid than in the blood, where it is likely to be obscured by blood corpuscles. In a few cases of malignant growths of the spinal cord or meninges, tumour cells have been found in the fluid. But this is inconstant, though tumour cells, if present, would have a high positive diagnostic value.

By far the most valuable point to be determined microscopically is the presence or otherwise of leucocytes, observing not only their number but their type. This is the so-called *cyto-diagnosis.*

Normal cerebro-spinal fluid contains no polymorpho-nuclear leucocytes, and only an occasional small mononucleated lymphocyte, with now and then a few endothelial plates. Examination of the centrifuged deposit, with a magnification of 400 diameters, according to the technique already described, should not show an average of more than two or three lymphocytes to the field. Sometimes we find no cells of any sort. But in certain organic diseases of the central nervous system or its membranes, there may be a large excess of leucocytes—polymorphs or monomorphs. Briefly stated, in all cases of acute microbic infection of the meninges, especially the suppurative varieties, we find a polynuclear leucocytosis, where the leucocytes are mostly polymorphs, with some large monomorphs as well. But in sub-acute and chronic affections of the meninges, whether tuberculous, syphilitic, or otherwise, also in certain chronic degenerative diseases of the central nervous system, we find a lymphocytosis, *i.e.* an excess of monomorphs, mostly small, sometimes accompanied by a small proportion of large monomorphs.

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[1] *Brit. Med. Journ.*, London, 1903, November 21.

Within the past few months I have kept records, by means of camera-lucida tracings, of the number of cells in the deposit from the cerebro-spinal fluid in a series of 105 cases of various nervous diseases, organic and functional. The results of these examinations may be classified into three groups:—

1. Normal Fluid, with no excess of cells (four or less per field)—

Functional monoplegia with headache	1 case.	
Epilepsy	3 cases.	
Insanity, apart from general paralysis	3 ,,	
Disseminated sclerosis	4 ,,	
Intracranial tumours	10 ,,	(see special Table).
Obscure headache and vertigo	2 ,,	
Peripheral neuritis	2 ,,	
Primary optic atrophy	1 case.	
Purpura, with retinal hæmorrhages	1 ,,	
Cerebral hæmorrhage	2 cases.	
Tetanus	1 case.	
Tumours of spinal cord (1 angioma, 1 sarcoma)	2 cases.	
Syringomyelia	1 case.	
Postero-lateral sclerosis	2 cases.	
Deep-seated pneumonia with pseudo-meningitis symptoms	1 case.	
Syphilis, primary, secondary, or tertiary	12 cases	(see special Table).

2. Lymphocytosis—

(*a*) *Slight.*—Less than ten lymphocytes to the field—

Combined degeneration of pernicious anæmia	1 case (7·1).
Acute "myelitis," in syphilitic patients	2 cases (8·0 and 8).
Tuberculous tumour of cortex cerebri	1 case (6·3).
Persistent headaches of obscure origin	1 ,, (6·9).

(*b*) *Moderate.*—From ten to twenty-five lymphocytes to the field—

Gumma of spinal cord	1 case (19·0 cells).
Landry's paralysis	1 ,, (18·3 ,,).
Endothelioma of spinal cord	1 ,, (13·8 ,,).
Cerebral thrombosis. Hemiplegia.	1 ,, (15·3 ,,).

Post-epileptic visual hallucinations (? syphilitic)	1 case (15·2 cells).
Old syphilis + hemiplegia of functional type	1 ,, (12·7 ,,).

(*c*) *Marked.*—From 25 lymphocytes to 200, 300, 400 or more—

General paralysis of the insane .	12 cases (see special Table).
Tabes dorsalis	25 ,, (,, ,,).
Gumma of crus cerebri . .	1 case (40 lymphocytes).
Gumma of spinal cord . .	1 ,, (52·6 ,,).
Syphilitic hemiplegia (thrombosis)	1 ,, (67·6 lymphocytes + 3·3 polymorphs).
Tuberculous meningitis . .	2 cases (35·6 and 30 lymphocytes).
Glioma of corona radiata . .	1 case (75 lymphocytes).
Posterior hydrocephalus, relieved by operation	1 ,, (35·6 ,,).

3. Polymorpho-nuclear Leucocytosis—

Epidemic cerebro-spinal meningitis	87·3 per field.
Meningitis from otitis media .	371 ,,

Let me refer to some illustrative cases. One case was an example of epidemic cerebro-spinal meningitis in a man who was comatose and apparently moribund. The cerebro-spinal fluid was under excessive pressure, of turbid appearance, and showed microscopically an average of 87·3 polymorphs to the field. Within many of the leucocytes the meningococcus was readily distinguished. The withdrawal of about 1 oz. of fluid caused marked improvement in the symptoms, and the patient made a good recovery. Another case was that of an officer who had chronic otitis media on the left side. He rapidly developed mental dulness and slight aphasic symptoms, with some fever. In his case the fluid was turbid, and showed no fewer than 371 polymorphs to the field. Operation was at once undertaken by Mr. Ballance, and an inflamed area of brain tissue was exposed in the temporo-sphenoidal lobe. No abscess was found. The symptoms rapidly subsided, and the patient made a complete recovery.

Among the cases where the cerebro-spinal fluid was normal may be mentioned that of a child in whom, as is so often the case, a deep-seated pneumonia was ushered in by head symptoms simulating meningitis. There was marked headache, some head retraction, and squint. Moreover, an older child in the same family had previously died from meningitis, and the parents were therefore in considerable anxiety as to the possibility of a second case. The cerebro-spinal fluid, however, showed no excess of cells. Meningitis was therefore unlikely, and an encouraging prognosis was given, which fortunately proved correct.

With regard to the cases of lymphocytosis, the most striking results were those observed in general paralysis of the insane and in tabes dorsalis. The lymphocytosis in these two affections (which are essentially the same disease etiologically, and which clinically are not infrequently combined in the same patient) is more marked than in any other form of organic nervous disease. Thus, in a series of twelve cases of general paralysis, the average number of lymphocytes to the field was 133·4 per field, the lowest count in any one case being 26·6, and the highest 481. In the series of twenty-five tabetics, the lowest count was 36, the highest 316, and the average number per field for the whole series was 143·3. This closely approximates to the average for general paralysis.

A point of importance to notice in these cases of tabes and general paralysis is that not only was lymphocytosis present in every case, without exception, but that it was often extremely marked when the other symptoms of the disease were very slight. Thus, for example, one patient had no ataxia; his knee-jerks were still present. But the ankle-jerks were lost, and his cerebro-spinal fluid had 214 lymphocytes to the field. The same applies to general paralysis. The patient with 481 lymphocytes to the field was an early case, with practically no mental symptoms, simply a slight loss of memory and a history of transient aphasia and weakness of the right hand after an attack of unconsciousness—a congestive attack. He had also slight fibrillary tremors of the face.

We therefore possess in the cytological examination of the cerebro-spinal fluid a valuable and apparently a constant means of recognising tabes and general paralysis in their earlier stages. If no excess of lymphocytes is present, these two diseases can be confidently excluded.

A further point of interest is that the lymphocytosis in tabes and general paralysis of the insane is uninfluenced by the most energetic anti-specific treatment. In several of my cases, the fluid was examined at intervals of a month, the patient in the interval having had daily hypodermic administration of mercury. Yet the lymphocytosis remained unchanged in its intensity. This is in marked contrast to active syphilitic lesions. Thus, for example, in a case of gumma of the spinal cord, the lymphocytes, which numbered 52·6 on admission, were reduced after three weeks' treatment to 16·1, and the patient, who was totally paraplegic and anæsthetic in the lower limbs on admission, was discharged in a couple of months able to walk, without anæsthesia, and with the sphincters under control.

Another point of importance is that syphilis of itself, unless an active syphilitic lesion attacks the central nervous system, produces little or no excess of lymphocytes in the cerebro-spinal fluid. Thus, in the series of twelve cases of syphilis (most of which, through the courtesy of Mr. Charles Ryall, I had the opportunity of examining at the London Lock Hospital), in the five secondary cases, the average number of lymphocytes was 2·7, that of the six tertiary cases being 0·9, the twelfth case being one of a man who had a syphilitic chancre twenty-six years before. The tertiary cases with active syphilitic lesions, such as gummatous ulcers, rupia, etc., had more cells than the others, but even they were less than the average of the secondary cases.

We thus see that the presence of a large lymphocytosis in a patient who has had syphilis is of grave significance, and indicates serious organic disease, either syphilitic disease of the central nervous system, or, if very marked, tabes or general paralysis. In such cases we should carefully examine for other signs of organic disease, especially for Argyll Robertson pupils, early optic atrophy, alterations in the reflexes, etc. And even if no other sign of organic disease be present, the presence of lymphocytosis of the cerebro-spinal fluid is an indication for the most energetic anti-specific treatment, in the hope, perhaps, of preventing subsequent developments.

The presence of lymphocytosis in tuberculous meningitis is readily understood, also in tuberculous tumours on the surface of the brain. It is more difficult at present to account for the occasional excess of lymphocytes in neoplasms. Thus one case of glioma of the centrum ovale had no fewer than seventy-five lymphocytes to the field, a count which led one to expect a tuberculous mass, there being no possibility of syphilis. And yet the autopsy showed a glioma which had in no way approached the meninges, and which ultimately caused death by a hæmorrhage into its substance, bursting into the lateral ventricle.

2. Therapeutic Applications of Lumbar Puncture.—Lumbar puncture was originally introduced by Quincke for the purpose of relieving intracranial pressure in tuberculous meningitis. This it does for the time, though it cannot, of course, be more than a palliative measure. In one case of mine, however, the patient, a young man, who was comatose and apparently moribund from tuberculous meningitis, regained consciousness for a day, after the withdrawal of 22 c.c. of cerebro-spinal fluid. At the time of puncture, the fluid was allowed to flow until the increased intrathecal pressure fell to normal. The importance of this procedure, not only from sentimental but possibly on medico-legal grounds, is obvious.

In intracranial pressure due to other causes, as, for example, in cerebral tumours which are inoperable or inaccessible, lumbar puncture is sometimes of distinct benefit, by diminishing the pressure and thereby relieving headache, vertigo, and other symptoms. Hitherto it has been the custom to trephine the skull as a palliative measure to relieve intracranial pressure and to diminish optic neuritis. But lumbar puncture is quicker, simpler, and less dangerous than a major cranial operation. I have performed it in three cases of intracranial tumour where the symptoms pointed to deep-seated cerebellar disease. In all of them the headache and vertigo were markedly relieved for several weeks after the puncture, and an opportunity was afforded of studying the patient's focal symptoms with a view to removal of the growth. In intracranial growths, however, we must be careful not to withdraw too large a quantity of cerebro-spinal fluid, lest sudden diminution of pressure cause a hæmorrhage into the tumour (a result, by the way, which sometimes occurs after a palliative trephining). In a case recorded by Masing[1] this actually occurred. But in his case the fluid was allowed to run for quarter of an hour, and no less than 30 c.c. were withdrawn! I have had under my observation several cases of persistent tinnitus and giddiness, of many months' duration, in which a single lumbar puncture with the removal of less than 10 c.c. of fluid relieved the condition permanently. We must, of course, be careful to eliminate all the ordinary causes of tinnitus and giddiness, aural or otherwise, before resorting to this treatment. Two of the above cases were sent to me by Dr. Dundas Grant and Dr. George Cathcart respectively, so that it is certain that every available local treatment had been tried.

In fractures of the base of the skull, coma may be relieved in a remarkably short time by the withdrawal of cerebro-spinal fluid. I saw such a patient after a carriage accident, in whom lumbar puncture was followed by rapid improvement. The procedure may be repeated several times on successive days, if necessary.

Cases of uræmic coma and convulsions are often relieved in a striking manner by lumbar puncture, and in several instances the patient's life has undoubtedly been saved by this means. For example, M'Vail[2] records two cases of acute nephritis in which, in spite of energetic treatment by purgatives, hot air baths, and pilocarpin to induce free perspiration, coma and convulsions supervened. Lumbar puncture was performed, 6 or 8 drms. of cerebro-spinal fluid were withdrawn, and within three or four hours the coma passed off, the convulsions ceased, and both patients ultimately recovered completely. Cases such as these raise the question as to whether the headache, coma and convulsions in nephritis are really caused entirely by "uræmic poisoning" of the brain centres, or whether they may not be due largely to a sudden increase of intracranial pressure—part of the general œdema.

Again, in cases of tetanus, we know that the tetanus poison has a selective action on the motor nerve cells of the spinal cord and brain. And therefore, in addition to removing the tetanus bacilli at the site of inoculation, by excision of the original wound, we endeavour also to neutralise the toxin by means of antitoxin. This is sometimes administered hypodermically. But it is much more efficacious, as Roux and others have shown, if injected into the cranial cavity through a small trephine opening; and some remarkable recoveries have followed this method of treatment. But the procedure is not free from danger. In one case, at least, the patient died of cerebral abscess at the site of the trephine opening eight weeks afterwards, long after all symptoms of tetanus had disappeared. It is easier and better to administer the antitoxin, with perhaps the addition of β eucaine and morphine, by means of a lumbar puncture needle.

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[1] *Neurol. Centralbl.*, 1904, p. 1116.

[2] *Brit. Med. Journ.*, London, 1903, vol. ii.

Strychnine poisoning is also successfully treated by intraspinal administration of eucaine. It may be necessary to give a general anæsthetic before the first intraspinal puncture to relax the opisthotonos.

Within the last few years, injection of cocaine or of eucaine by lumbar puncture has been a somewhat popular procedure among surgeons, particularly in France, to induce spinal anæsthesia for the purpose of doing operations on the lower limbs or the lower part of the trunk. The patient in these cases remains conscious throughout the major operation. Such a procedure, however, should be reserved for very special cases, since, from the patient's point of view, complete unconsciousness is preferable to the mental strain of consciousness whilst an operation is being performed on his anæsthetic legs. Moreover, there is a risk of the cocaine ascending too high to the medulla, and paralysing the vital centres there. This has actually occurred in some cases.

Table I.—*Lymphocytes in Syphilitic Patients without Signs of Nervous Disease.*

No.	Name and Age.	Stage.	Period after Infection.	Lymphocytes.	Remarks.
1.	B. æt. 25	Secondary.	Two months.	1·4	...
2.	F. ,, 25	,,	Four ,,	2·8	...
3.	M'G. ,, 20	,,	Six ,,	3·3	...
4.	B. ,, 26	,,	Three ,,	0·3	...
5.	C. ,, 18	,,	Two ,,	5·9	Chancre still present.
6.	B. ,, 43	Tertiary.	Three years ten months.	0·0	...
7.	R. ,, 27	,,	One year three months.	0·3	...
8.	W. ,, 30	,,	Two years six months.	2·2	Rupia still present.
9.	M. ,, 32	,,	Three years.	2·3	Has ulcers of palate and shoulder.
10.	G. ,, 25	,,	One year three months.	0·3	...
11.	W. ,, 30	,,	Four years.	0·5	...
12.	S. ,, 48	Post-syphilitic.	Twenty-six years.	0·3	...

TABLE II.—*Intracranial Tumour.*

No.	Name and Age.	Diagnosis.	Lymphocytes.	Remarks.
1.	F. T. æt. 20	Intracranial growth (?)	No excess.	Cerebellar symptoms; operation; no tumour found; symptoms disappeared.
2.	G. N. ,, 30	Pontine tumour.	,,	Headache, optic neuritis, weakness of left face and of right arm and leg.
3.	Mrs. Q. ,, 32	Right cerebellar tumour.	,,	Tumour removed by operation.
4.	G. L. ,, 25	Basal intracranial growth.	,,	Optic neuritis; weakness of left face and palate.
5.	Mrs. B. ,, 32	Intracranial growth (?)	35·6	Cerebellar symptoms; operation; no tumour found; neuritis and other symptoms subsided.
6.	Mrs. B. ,, 56	Tuberculous tumour of motor cortex.	6·3	Operation; tumour removed.
7.	J. C. ,, 52	Intracranial tumour (?)	No excess.	Monoparesis of leg.
8.	P. N. ,, 30	,, , (?)	,,	All symptoms relieved by lumbar puncture; subsequent operation in another hospital revealed no tumour, but all symptoms subsided.
9.	Mrs. R. ,, 42	,, ,,	,,	Patient died several months later.
10.	J. S. ,, 53	,, ,, (?)	,,	Recurrent attacks of hemiparesis.
11.	W. J. ,, 29	Right frontal lobe sarcoma.	,,	Confirmed by autopsy.
12.	W. S. ,, 21	Glioma, subcortical.	75·0	Death from hæmorrhage into ventricle.
13.	W. T. ,, 31	Intracranial tumour.	No excess.	Headache and optic neuritis only.

[TABLE III.

TABLE III.—*Tabes.*

No.	Name and Age.	Disease.	Lymphocytes.	Remarks.
1.	J. T. æt. 53	Tabes.	88·4	Deep reflexes absent; no ataxia.
2.	E. M. ,, 33	,,	75·2	Well-marked case; perforating ulcer.
3.	A. C. ,, 40	,,	102·0	Pupils normal; no ataxia; one knee-jerk and one ankle-jerk absent.
4.	Mrs. R. ,, 31	,,	158·0	Well-marked case.
5.	S. N. ,, 65	,,	36·0	No ataxia; girdle pains; knee-jerks present; ankle-jerks absent.
6.	F. S. L. ,, 35	,,	45·0	No ataxia; lightning pains; one ankle-jerk absent.
7.	M. W. ,, 46	,,	214·0	No ataxia; knee-jerks present; ankle-jerks absent.
8.	G. C. ,, 42	,,	168·5	Well-marked case.
9.	W. S. ,, 45	,,	154·0	No ataxia; optic atrophy; deep jerks present; Argyll Robertson pupils.
10.	F. T. ,, 39	,,	150·0	No ataxia; Argyll Robertson pupils; weakness of one external rectus; deep jerks normal.
11.	F. K. ,, 44	,,	76·6	Well-marked case.
12.	J. V. O. ,, 53	Tabo-paralysis.	165·0	No ataxia; Argyll Robertson pupils; deep jerks absent; facial tremors.
13.	G. D. ,, 59	Tabes.	36·0	Well-marked case.
14.	G. F. ,, 63	,,	316·0	Well-marked case.
15.	A. E. ,, 37	,,	208·0	Pupils irregular but react to light; no ataxia; deep jerks absent.
16.	W. S. ,, 34	,,	82·0	Well-marked case.
17.	H. D. ,, 36	,,	93·0	Optic atrophy; no ataxia; Argyll Robertson pupils; knee-jerks present; one ankle-jerk absent.
18.	Mrs. S. ,, 50	,,	99·0	Well-marked case.
19.	F. J. ,, 36	,,	255·0	Well-marked case.
20.	J. C. ,, 45	,,	47·0	Well-marked case.
21.	J. A. S. ,, 37	,, (?)	278·0	Nerve-deafness; irregular pupils; bladder trouble; no ataxia; deep jerks normal.
22.	R. H. ,, 38	,, (?)	43·3	Optic atrophy; irregular Argyll Robertson pupils; no ataxia; deep jerks normal.
23.	W. de M. ,, 54	,,	225·0	Argyll Robertson pupils; no ataxia; knee-jerks present; ankle-jerks absent.
24.	T. B. ,, 44	,,	177·0	Well-marked case.
25.	W. E. ,, 54	Tabo-paralysis (?)	291·0	Irregular pupils; ataxia gait; marked bladder trouble; knee-jerks present; plantar reflexes extensor.

[TABLE IV.

TABLE IV.—*General Paralysis of the Insane.*

No.	Name and Age.	Diagnosis.	Lymphocytes.	Remarks.
1.	A. S. æt. 36	General paralysis of the insane.	93·3	Early case; lymphocytosis undiminished by energetic mercurial treatment.
2.	P. R. ,, 32	,, ,,	184·6	Early case.
3.	J. M. ,, 27	,, ,,	86·5	Well-marked case.
4.	E. W. ,, 42	,, ,, (?)	26·6	Epileptiform fits; no mental disorder.
5.	A. K. ,, 39	,, ,,	183·0	No mental or articulative trouble; transient hemiplegic attack.
6.	H. B. ,, 39	,, ,,	127·0	Early case; transient hemiplegia; patient died a year later.
7.	S. H. ,, 40	,, ,, (?)	47·5	Early case; congestive attacks.
8.	A. R. ,, 55	,, ,,	28·0	Early case.
9.	W. P. ,, 35	,, ,,	37·6	Early case; Argyll Robertson pupils; transient paralysis of limbs.
10.	D. W. ,, 44	,, ,,	107·0	Early case.
11.	J. T. ,, 38	,, ,,	481·0	Early case; transient aphasic attack.
12.	T. R. M. ,, 43	,, ,,	199·0	Early case; slight articulative difficulty; no mental symptoms; fits.

NOTES ON A CASE OF INTRA-PERITONEAL HÆMORRHAGE OCCURRING DURING LABOUR; RECOVERY.[1]

By D. A. CALLENDER, M.B., *Knutsford.*

THE following notes of a case I had under observation some time ago may be of interest, as I have not been able to find any reference to such a condition in any of the recently published works on obstetrics:—

CASE.—At 5.30 A.M. on the 5th of August 1902, I was called to a patient (4-para), æt. 40, who had been in labour for about six hours. The previous confinements had been normal ones. On examination, the lips were pale and blanched, and the surface of the body was cold, and covered with a clammy sweat. The pulse was 130 per minute, and very feeble, and the temperature was subnormal. In fact, she presented all the symptoms of an internal hæmorrhage. There was, in addition, considerable œdema of the upper and lower limbs, and a catheter-drawn specimen of the urine revealed the presence of both blood and albumin in large quantities. The urine was distinctly smoky in appearance, and was of high specific gravity. There had been no undue loss of blood per vaginam. On abdominal examination, no fœtal heart sounds could be heard, and the patient said she had felt no movement for two days. On vaginal examination, the os was the size of half a crown, and very rigid, and there was a certain amount of bogginess in the pouch of Douglas. Syrup of chloral (1 drm.) was administered without any marked effect. On account of the increasing collapse, and the possibility of there being a concealed accidental hæmorrhage, I dilated the os as rapidly as possible, ruptured the membranes, and delivered with forceps a still-born fœtus. The third stage was short, lasting only a quarter of an hour, and there was no abnormal loss of blood from the uterus. After delivery the uterus retracted well, although on percussion there was dulness in both iliac regions. The pulse still continued feeble and rapid. Whisky was given by the mouth in $\frac{1}{2}$ oz. doses every two hours, and saline injections by the rectum were administered every three hours. Hot bottles were applied to the feet, and mustard leaves over the heart. Digitalin, $\frac{1}{100}$ gr., strychnine, $\frac{1}{60}$ gr., and ergotin, $\frac{1}{30}$ gr., were given hypodermically, and this was followed in a short time by a slight improvement on the pulse. An exploring needle was passed into the left iliac region, and some blood-stained fluid was drawn off. At 10 P.M. digitalin and strychnine were again administered in the same doses as previously. The uterus was firmly retracted.

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[1] Read before the Edinburgh Obstetrical Society.

August 6.—The dulness in the flanks was less marked, and the pulse was more forcible, regular, and stronger, and only 100 per minute. The lips were of a better colour, and the temperature had risen slightly. The first sound of the heart became more distinct, and systolic murmurs were heard in all the cardiac areas. The œdema was still present, although the patient was passing an increased quantity of urine. Albumin was still present, and, on microscopical examination of the deposit, there were seen granular tube casts, and some bladder epithelial cells. The patient was being kept strictly on a milk diet.

August 7.—There was again a slight improvement in the patient's condition. The pulse was 96 per minute, and the temperature 98°.

August 8.—The temperature was normal, and the pulse 98 per minute. The bowels moved naturally, and the amount of albumin in the urine was diminishing. The uterus was well retracted, although there was some slight tenderness in the right iliac region. There was no sickness or nausea, and the patient had slept well. The lochia was fairly abundant, but otherwise normal.

August 10.—The pulse was 85 per minute, and the temperature 99°·4. The skin and bowels were active, and the abdominal tenderness had disappeared. There was a normal tympanitic note in both iliac regions. There was still some slight albuminuria, but there was a free secretion of urine, and the œdema was becoming much less.

August 15.—The patient felt much better. The pulse was 85 per minute, and of good tension, and the temperature was normal. There was only a faint trace of albumin in the urine, and the œdema had almost entirely disappeared. From this date the patient rapidly improved, and by 1st September was able to go for a change to the country.

REMARKS.—This case is interesting for two reasons—(1) That at the onset of labour there was some doubt as to the diagnosis;

and (2) the fact of there being albuminuria in such considerable amount without the presence of any eclamptic seizures. At first sight, the case closely simulated either a concealed accidental hæmorrhage or a rupture of the uterus. As I had not been engaged to attend the patient at her confinement, I could not say whether any albumin was present in the urine or not previous to the onset of labour. There was certainly a history of dropsy and anæmia, and the vessels were decidedly thickened and the blood tension high, and one naturally came to the conclusion that it was not an albuminuria dependent on the pregnancy, but due to some long-standing kidney disease. The history was that she had been in labour for six hours, and that she was suddenly seized with acute abdominal pain and tenderness, and became collapsed. The pains had been very strong and forcible. Such symptoms would lead one to suppose that a rupture of the uterus had taken place. Very little blood, however, had escaped by the vagina, and, on examination, no tear could be felt in the uterus, there was no receding of the presenting part, and the size of the uterus was unchanged. After excluding rupture, I then thought of the possibility of a concealed accidental hæmorrhage. Accordingly, I at once dilated the os, ruptured the membranes, and delivered with instruments a still-born fœtus. Much to my surprise, there was no abnormal hæmorrhage, and the placenta was expelled naturally within a quarter of an hour. The uterine retraction was fairly good. Thus one could exclude concealed accidental hæmorrhage as being a cause of the collapse. As I have stated above, an exploring needle was passed into the left iliac region, and some blood drawn off. This fact suggested there having been a rupture either of the peritoneal coat of the uterus or of one of the small branches of the uterine or ovarian vessels, which caused the collapse, and which ceased by maintaining firm uterine retraction. The cause of this hæmorrhage may be difficult to explain. If we take cerebral hæmorrhage as an analogy, there are always diseased vessels and chronic renal disease preceding the rupture. Such evidently was the case in the present instance, the hæmorrhage taking place from a uterine instead of a cerebral vessel. After labour the uterus retracted firmly, which caused contraction of uterine vessels, and so arrested the hæmorrhage. The treatment to adopt in such cases is to end labour as rapidly as possible, so as to ensure rapid and efficient retraction of the uterus. The question of abdominal section was raised, but, on account of the collapsed condition of the patient, it was considered inadvisable.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

The Medical Diseases of Egypt. Part I. By F. M. Sandwith, M.D., F.R.C.P. London: Henry Kimpton.

We must confess that our first impressions on taking up this work were not altogether favourable. There seemed to be a lack of any definite arrangement of the subject-matter. For instance, it is not customary to consider bilharziosis, ankylostomiasis, or even pellagra, as infectious diseases in the usual acceptation of that term, and yet there is nothing in the volume to indicate that they are a wholly different type of disease from, say, typhus or plague. Again, we missed illustrations, especially of parasites, which in our opinion would have been most useful. The fact that in the preface it is assumed that the reader has a standard work on medicine to which he can refer in no way excuses such an omission. Further, we find a chapter entitled "Introduction to Infectious Diseases," which cannot be regarded as having much educative value, and which contains such a slovenly paragraph as the following, the italics being ours:—

"Sometimes there is no predisposition *like* the hen *who* is resistant to tetanus."

Increased familiarity with the volume, however, happily caused us to modify our original impressions, more especially when we found that the main object of the work is to meet the needs of the Egyptian student of medicine. To anyone who knows the latter, either as the raw or finished product, the feeling must be present, after the perusal of Dr. Sandwith's book, that in many ways the author has attained the primary object at which he aimed. The work is very different from the ordinary text-book of medicine. It is indeed a kind of modified and magnified doctor's diary, edited with notes, brought up to date, and fully supplied with references and extracts. Dr. Sandwith must be a great note-taker and a keen observer. His records of cases represent a vast deal of labour and indefatigable zeal. He has an easy style, and the book forms agreeable reading.

The chapter on Medical History in Egypt is short but good, and with the exception of the points already noted, there is little whereat one can cavil. Occasionally Dr. Sandwith strays entirely from Egypt, and one cannot understand what acute suffocation by sewer gas, as mentioned on p. 63, has to do with enteric fever; but these are minor faults, probably inseparable from the style of writing adopted. A great deal of useful information, not easily obtainable elsewhere, can be garnered from a perusal of these pages. The chapter on Enteric Fever is sound, and appears to be well up to date. Malta fever receives careful consideration, and the article on Infectious Jaundice, a disease concerning which Dr. Sandwith speaks with authority, deserves mention. So, as might have been expected, does that on Pellagra, and this chapter may be excluded from our remarks regarding lack of illustrative matter, for there is a good plate of the skin eruptions and figures of the cord lesion. We are glad to see that under ankylostomiasis is included *verbatim* an account of Looss's admirable and remarkable work, while this chapter contains a good photograph of an ankylostome attached to the intestine and in process of devouring the wall of the gut. The portion devoted to Plague is, we think, well done, though in the next edition there will have to be several additions to this section, on which much new and recent work is accumulating. The same observation applies to Malta fever. We shall look with interest for Part II. of Dr. Sandwith's book, and we hope that the indications of haste, which we think we detect in Part I., will be absent from the next volume. It was time that a work on modern Egyptian medicine should be forthcoming, and Dr. Sandwith's large experience, both as a practitioner and as a teacher, eminently fitted him for the task. Egyptian medical students will welcome the book, and it will solve several problems likely to perplex and worry newly appointed English doctors in Egypt, who naturally cannot be familiar with rashes and eruptions on coloured skins, or with the symptoms of diseases rare or unknown in Britain, but of everyday occurrence and of great importance in the ancient land of the Pharaohs.

A Manual of Physiology. By G. N. STEWART, M.A., D.Sc., M.D.Edin., D.P.H.Camb. Fifth Edition. London: Baillière, Tindall, & Cox.

OF the many good text-books of physiology issued by American authors, Stewart's Manual has been for a long time one of the best known in this country, and a favourite with the student. During the last few years many new facts have been added to physiology, and in Britain it has become an almost established custom for some well-known text-books at any rate to appear newly edited every year. The last edition of Stewart's Manual was published in 1900, consequently it was out of date with regard to much recent work. The new edition has been thoroughly revised and enlarged, but the additions have been effected chiefly by the substitution of small print in many places for the usual type, and the book is not more bulky, and remains a handy volume.

The arrangement of the former editions has been adhered to, and a feature of the book is the incorporation at the end of each chapter of a set of practical exercises bearing on the theoretical work just discussed. This combination of theory and practical work in one book will not commend itself to all, but, no doubt, works well in American schools. The student in this country could not very well use the Manual to do his practical work from; many of the experiments described he must see by demonstration alone; he will also prefer to do his chemical physiology from one of the numerous books which specially deal with that subject. But this does not depreciate the value of the book, and the combination of theory and practical work is very useful in refreshing the memory and linking the two things together. The exercises are well illustrated, and explanations of instruments which are often omitted from text-books and practical treatises find a place here.

There are, as before, two coloured plates in the volume representing histological subjects; they are of doubtful utility, and could be dispensed with quite well. One of the additional figures represents Macallum's micro-chemical test for potassium in animal cells. Histology is scarcely treated at all in the book, excepting where absolutely necessary for description of function; but this is the general custom in text-books of physiology.

The material in the book has been brought well up to date, and includes Head's experiments on sensory nerves, and other quite recent discoveries. The new edition is a very welcome one, and will increase the popularity the book has enjoyed in the past.

A Manual of Pharmacology. By Walter E. Dixon, M.A., M.D., B.Sc., D.P.H. Illustrated. London: Edward Arnold. 1906.

In the opening words of his preface, Dr. Dixon states that his object in writing this book has been "to give a simple account of the science of Pharmacology," and in this he has been on the whole signally successful. "Simple" is not perhaps the most accurate descriptive term that might be used, as the style is terse and the information closely packed in certain places, so that considerable demands are made on the attention of the reader as well as on his knowledge of modern physiological methods and thought. But the author has the great merit of having produced a comparatively small book which covers practically the whole ground of our present knowledge of the action of remedies in everyday use. Mere materia medica has been relegated to a very subordinate position, while the therapeutical applications of medicines are dealt with very perfunctorily, and merely as a side issue in relation to their pharmacological actions. The text is illustrated by a large number of original tracings, and by many instructive diagrams, which is practically a new departure in English works on pharmacology, and one which it is hoped may be imitated in the future by other authors. As a treatise on therapeutics, the work is not one likely to prove of immediate value in everyday practice, but it may be strongly recommended to any one desirous of obtaining a sound knowledge of the principles and facts which underlie the treatment of disease by means of drugs.

Diseases of Infancy and Childhood. By L. Emmett Holt, M.D. Third Edition. London: Sidney Appleton.

In all American text-books on diseases of children we now expect to find a full discussion of the important subject of infant feeding. In many of them much space is devoted to methods which suggest that the ordinary American infant must possess an abnormal stomach, and that the ordinary American parent must possess abnormal wealth. While Dr. Holt expresses a liking for the percentage method of feeding, by means of laboratory milk, he also gives full details as to how milk can be modified at home, quite simply and quite successfully. His dietetic instructions after the age of one year are very good so far as they go, but the omission of any mention of hard foods for children, so as to encourage the proper development of the teeth and thorough digestion, seems unfortunate.

The various diseases of childhood are classified under the different systems—digestive, respiratory, etc. The author seems to be in some doubt as to the classification of rheumatism, which occupies a separate section, along with diabetes mellitus. We do not think the subject of rheumatism is discussed with the fulness which its importance merits, at least in this country. Six pages in this volume of 1174 pages are devoted to rheumatism, while cerebro-spinal meningitis gets fourteen pages, and diphtheria forty-three pages. This inequality of treatment must inevitably happen in the case of a text-book by a single author, but we think that Dr. Holt might considerably reduce the length of many articles without diminishing the value of his work. In this edition the principal changes are new articles on stenosis of the pylorus, vaginitis, mental defects, chondro-dystrophy, and the status lymphaticus, while many of the former chapters have been entirely re-written. Every care has been taken to bring the volume up to date, and the result is that it may be considered the best American text-book on this special subject.

The illustrations, about 250 in number, are well chosen and well executed. As regards the coloured ones, we can only express the wish that nature would produce the signs of disease in an equally well-marked form.

NOTES ON BOOKS.

It is not surprising that a new edition of this well-known text-book—*Bruce's Materia Medica and Therapeutics* (Cassell & Co. Ltd., London)—should be called for. The present edition has been thoroughly revised and brought up to the level of our latest knowledge. It has been enlarged by forty-eight pages, part of this enlargement being accounted for by an entirely new section dealing with the drugs in the Indian and colonial addendum to the British Pharmacopœia. This section should be of much service, and considerably enhance the value of the work.

In this little book—*Natural Science in Hygiene*, by James R. Watson, M.D. (John Wright & Co., Bristol)—are given the life-histories of those members of the vegetable and animal kingdoms which are important from a public health point of view. Bacteria are not included. The author has succeeded in producing a very readable handbook, written in a clear and succinct style, and without the least suspicion of "padding."

These rules—*Golden Rules of Sick Nursing*, by W. B. Drummond, M.B. (John Wright & Co., Bristol)—might with advantage be studied, not only by nurses, for whom they are written, but by medical students attending dispensary cases, who are frequently wofully ignorant on the subject of sick nursing. They will find many valuable hints in this little book, which we heartily commend.

Since this book—*Physical Education of the Young*, by Samuel Smiles (The Walter Scott Publishing Co. Ltd.)—was written (1838) the science of hygiene has been born, and has grown to vigorous manhood. Many Public Health Acts have been passed, and the number of public health officers charged with their administration is very large. Despite these changes, however, this book on physical education is not out of date. The question at the present moment bulks largely in the public mind. The alleged deterioration of the race calls for serious investigation, and the cry of "back to the land" is one which is to occupy the Government in the near future. In an interesting foreword the editor of this new issue of Sir Samuel Smiles' work, Sir Hugh Beevor, calls attention to the changed conditions under which the child of to-day lives, moves, and has his being, and contrasts them with those of his predecessor of sixty years ago. The contrast is not in favour of the present-day child, whom he regards as over-educated, under-exercised, and injudiciously fed. The book is very little altered from its original form, and gives a very good sketch of the best practices in physical education. Its publication at the present time is most opportune.

This volume—*Contributions to Clinical Surgery*, by J. Crawford Renton, M.D. (Rebman Ltd., London)—contains reprints of papers contributed by Dr. Renton to various medical journals during the past thirty years, and forms a most valuable collection of records of operations performed on practically every region of the body. Dr. Renton records his cases in a most interesting manner, and, without sacrificing necessary details, is commendably brief throughout. His reflections on his cases are of much value. From such a wealth of material one can only select one or two subjects for special mention. The operation for excision of the Gasserian ganglion in cases of intractable neuralgia of the fifth nerve was performed on two occasions with complete success. Many operations on the abdominal organs are recorded, and one is struck by the fact that in several cases of exploratory laparotomy, where nothing further was done owing to the apparently incurable condition revealed, the patient made a complete recovery. The complete disappearance of what were regarded as malignant tumours of the pylorus, after the operation of gastro-enterostomy, is also noted. Dr. Renton is to be especially congratulated on the evident care with which he takes and preserves notes of his cases.

Dr. T. D. Luke has followed up his book on anæsthesia for the use of the general practitioner by a second edition of *Anæsthesia in Dental Surgery* (Rebman Limited, London). The different anæsthetics, the methods of administering them either alone or in the various mixtures and sequences, the apparatus for their administration, and the advantages and dangers of each, are fully described. With certain specified exceptions, chloroform is regarded as inadmissible as a dental anæsthetic.

There is a chapter on local anæsthesia, and another on the legal and ethical aspects of the administration of general anæsthetics by dentists. The book is in every sense a complete theoretical and practical account of anæsthesia in dental surgery, and should be very serviceable to all concerned in work of this nature.

The sixth edition of *Notes on Surgery for Nurses*, by Joseph Bell, M.D., F.R.C.S.Ed. (Oliver & Boyd, Edinburgh), is difficult to criticise, for no book on surgery published in 1887 and based on lectures delivered during the twelve previous years can be "thoroughly revised" into line with modern ideas; it would require to be re-written. We can hardly speak nowadays of "the germ theory, which some believe in, and some do not"; or describe septicæmia as "the scapegoat" of the laparotomist; or say hesitatingly that "every hospital worthy of the name, and most surgeons, have their instruments constantly sterilised before every operation in suitable sterilisers." Nor can any manual for nurses be complete which does not give a detailed account of the preparations necessary for an aseptic operation or dressing. In other words, the book is not a text-book on the subject, but rather a collection of short useful chapters for nurses on a number of surgical subjects. The author's name is a guarantee that they are readable and interesting. Two additional chapters, one on "General Advice to Nurses," and the other "On the Relation of the Trained Nurse to the Profession and the Public," are both true and humorous, and will be read with pleasure by others besides nurses.

Another book on the same subject, but written from a different standpoint, is *Surgical Nursing*, by Russell Howard, M.B., M.S., F.R.C.S. (Edward Arnold, London). It gives clearly and shortly the surgical principles and the practical points which a nurse must know. The essential facts regarding bacteria, and the procedure necessary to secure asepsis in an operation wound, are fully described, and there are some specially useful hints on the treatment of post-operative discomforts and complications. In addition to chapters on such subjects as inflammation, hæmorrhage, wounds, shock, new growths, and fractures, there are others on the nursing of special cases, including those of tracheotomy and mouth operations, and of ophthalmic, cerebral, rectal, and urinary diseases. There are also details regarding bandaging, massage, and the care of infants, and an appendix of useful formulæ for enemata, etc. This is the best book that we have read on the subject of surgical nursing.

Essentials of Surface Anatomy, by Chas. R. Whittaker, L.R.C.S., L.R.C.P. (J. & A. Churchill, London), contains thirty-nine pages with blank interleaves, and is intended for those desiring "a quick revision of the salient points of surface marking." For this purpose it should be sufficient, but certainly nothing is given save the salient points. In so short a volume a little care would have avoided such errors as "pomum Adamii," "diverticulæ," and "meati" as the plural of meatus.

A Guide to the Administration of Ethyl Chloride, by G. A. H. Barton, M.D. (H. K. Lewis, London), is little more than a pamphlet. He considers that the patient should be prepared as for chloroform. For prolonged ethyl chloride anæsthesia during operations on the mouth or throat Dr. Barton has devised an apparatus resembling Junker's for chloroform, and he has now used it in 100 cases, some of which required twenty minutes' anæsthesia. His routine method of inducing chloroform anæsthesia is to let the patient inhale C.E. on a Skinner's mask for a half to one minute, then to spray on ethyl chloride and cover the mask with a folded towel, and lastly, to continue with C.E. or chloroform, the patient being ready in two minutes from the commencement. The little book is interesting as giving the results of the author's experience of 1500 cases.

The chief object of this little book—*Tumours of the Cerebellum*, by Charles K. Mills, Charles H. Frazier, George E. de Schweinitz, T. H. Weisenburg, and Edward Lodholz (A. R. Elliott & Co., New York)—is to justify operative interference in tumours of the cerebellum. The methods and results of such interference are well described, and a tabulated list of over one hundred cases shows the amount of success which has attended operation, on the whole, perhaps, in too favourable a light. Tumours of the lateral lobes afford the best chance of recovery after removal, as considerable portions of these may be removed without endangering life. The ocular symptoms are considered by Dr. de Schweinitz, the pathology by Dr. Weisenburg, and the functions of the cerebellum by Dr. Lodholz.

In *Chapters in Pathology*, by W. S. Greenfield, M.D., and George Lyon, M.D. (Edinburgh: Wm. Green & Sons, 1905), we have a small book giving the outlines of Professor Greenfield's lectures on some elementary subjects, in which he regards the ordinary text-books as being in error. After a few pages on cell structure and cell life, the various degenerations, infiltrations, and allied conditions are shortly described. The latter half of the book is, perhaps, the more interesting, containing, as it does, personal views on circulatory obstruction, including infarction, and on the processes of inflammation, absorption, and cicatrisation. Inflammation is defined "for all practical purposes" as being "the series of reactions which follow irritation or injury," not necessarily due to bacteria and their toxins, though these are the most important causes, and the various phenomena of inflammation are described. The book is written in a succinct and interesting manner, and should be helpful to the student. The addition, in the absence of an index, of at least a table of contents, would have increased the value of the book.

A Short Practice of Midwifery for Nurses, by Henry Jellett, M.D. (London: J. & A. Churchill), contains considerably more information than a nurse requires for her own everyday practice. It explains the various lines of treatment which she does not herself carry out, but which she must understand in order to afford intelligent assistance, while the duty of summoning medical aid in all abnormal cases is duly emphasised. With the ordinary routine of the nurse's work the book deals fully. Asepsis, pelvic and fœtal anatomy, and the phenomena and management of normal pregnancy, labour, and puerperium, and of the various complications, are well described with all practical details, the etiology being shortly explained where it is necessary for a proper comprehension of the condition. The book is clearly written and abundantly illustrated; most of it should form a good text-book for the nurse, while the rest constitutes a satisfactory book of reference.

The *Appendix to Squire's Pocket Companion to the British Pharmacopœia* (London: J. & A. Churchill) contains a résumé of new drugs and apparatus, and new uses of old drugs which have come into notice since the publication of the *Companion*, with references to their literature. This little *Appendix* presents the features of the original book, and therefore requires no special description.

The great bulk of this volume—*St. Thomas' Hospital Reports*, vol. xxxiii. (Churchill, London)—is taken up with the reports of the registrars. In addition to the usual somewhat bald tables of statistics, short abstracts of all the more interesting cases are given. Some of the special tables, such as the one showing the results of operation on cases of extra-uterine gestation, are of considerable value. Apart from these tables there is an elaborate report of 1075 cases of appendicitis, a paper on the pathology and recorded cases of torsion of the omentum, and a statistical statement on pathological perforations of the stomach and duodenum. The volume also contains obituary notices of Sir John Simon and Dr. Alexander Oberlin Mackellar.

Archives of the Middlesex Hospital, vol. vi. (Macmillan & Co., London, 1905), contains reports of the registrars for the year 1904, and some ten papers on a variety of medical subjects. Among the latter is an account of a new and easy process of triple staining, which would seem well worth a trial.

This volume — *Transactions of the Association of American Physicians*, vol. xx. (Philadelphia, 1905)—comprises a series of papers well above the average of Clinical Society Transactions. Under the title of "Ailurophobia," Weir Mitchell deals with symptoms which may be induced by the proximity of cats. He finds that there are persons who suffer from cat asthma; persons who suffer from cat fear, with or without excessive emotional manifestations, and only on sight; and those who have the power to be sure an unseen cat is near, and who, consequently, may or may not suffer from emotional symptoms. This last class may be able to recognise the presence of a cat by smell, but some can do so without smelling it. It is possible that cat emanations may affect the nervous system through the nasal membrane, although unrecognisable as odours. Many of the victims of cat fear declare that even strange cats seem to show an unusual desire to be near them.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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EXOPHTHALMIC GOITRE.

A NUMBER of papers dealing with Graves' disease, particularly in reference to recent attempts to discover a specific remedy, have appeared within the past year. Dock (*Am. Med.*, Phila., 1906, February 24) gives the result of *a clinical study of thirty-two consecutive cases* of exophthalmic goitre, which, as well as simple goitre, is somewhat prevalent in the district round Michigan. The etiologic factors in Dock's cases differ from those usually regarded as important, especially in the scanty history of hereditary nervous disease, worry, shock, and fright. As a rule, the malady came on without any certain cause, though in many cases there had been some antecedent acute illness. As a rule, palpitation was the symptom first recognised. Tachycardia was present in all but two cases—males—in whom the pulse ranged from 60 to 80; from 120 to 140 was the rate most frequently met with, but in one case it reached 225 at times. Capillary pulse was noted in four cases. On physical examination of the heart, the organ was, as a rule, found to be enlarged; arhythmia, reduplication, galop-rhythm, and systolic murmurs were present in different cases. A diastolic aortic bruit was twice heard without there being any other evidence of aortic disease. The blood pressure was carefully estimated in most of the cases; it was, as a rule, high,—140 mm. or over,—falling under treatment. There was no definite relation between the high blood pressure and the pulse rate. This high pressure in exophthalmic goitre cannot be explained by any simple hypothesis. The current idea that the arterial pressure is low depends no doubt on the character of the pulse, which in many cases seems to the touch to be of low tension. "Sphygmographic tracings show that in many cases the tracing is high, quick in ascent and fall, without marked elasticity waves, and sometimes dicrotic." Such a tracing may be obtained from a vessel showing a maximum of 150 and minimum of 110. Not rarely, however, the tracing shows a low wave, with a broad apex, like that of a high-tension pulse. Such tracings may have pressures of 175, 145, and also 100. With improvement in the rate, the pulse often comes to resemble the normal, though easily made high and quick by the fatigue of having tracings taken. Eye symptoms were absent in three cases only; in eight patients, all four signs—exophthalmos, von Graefe's sign, Stellwag's sign, and Möbius's weak convergence—were found. Stellwag's and Graefe's signs are sometimes seen in cases in which there is no ground for making a diagnosis of exophthalmic goitre. Diminution of reflex winking, and of the normal wrinkling of the brow on looking upwards, and excessive lachrymation were also noted. Of other symptoms, tremor was present in all but four patients; while mental agitation was common, no marked psychic disturbance was observed. In cases in which dyspnœa was complained of, the thoracic expansion was found to be very small—sometimes not more than half an inch; Litten's diaphragm phenomenon was also very imperfectly seen in these cases. Marked diminution of the red cells and hæmoglobin was rare; the chief change in the blood was leucopenia, present in nearly half the cases. Dock examined the digestive functions with special care on account of the importance of diarrhœa. Gastroptosis was no more frequent than among other patients. Test meals were given in six cases; five showed good motor power, or even hypermotility, while in one motility was diminished, and there was slight stagnation. Free HCl was greatly reduced or absent in three cases; mucus was excessive in two. Abnormalities of the urinary and sexual organs were comparatively unimportant. In the *diagnosis* of early cases, Dock lays much stress on the occurrence of a murmur over a goitre, which is practically never heard over simple thyroid enlargements. The characteristic bruit is usually systolic, but may be continuous or double. It sounds near, and is best heard just above the sterno-clavicular articulation. It is most common on the right side, and can usually be distinguished from a transmitted murmur. Speaking of the *pathology* of the disease, Dock's view is that to regard it as a condition of hypothyroidism or dysthyroidism can be true only in a general sense, as all recent work on the physiology of the thyroid and parathyroid glands shows that their functions are much more complicated than was at first believed.

Treatment.—Thyroid extract was tried in nine cases, with little effect, apparently, one way or the other. Thyroidectin was employed in seven cases; it evidently has some action, as patients seem to become habituated to it, and to feel the deprivation when it is stopped. On the whole, it does not seem to diminish the pulse rate, and in one patient a rise of temperature and chills were caused. Adrenalin and thymus extract had no obvious effect. X-rays were twice used, without benefit. Dock relies on symptomatic treatment, on the usual lines. He does not regard sodium phosphate as of any special use, though he gave it fairly freely—60 to 180 grs. per diem. Neither is he a believer in electricity, while partial thyroidectomy is risky and should be reserved for the worst cases.

The *pathological anatomy* of twenty-eight cases of Graves' disease has been studied by MacCallum (*Johns Hopkins Hosp. Bull.*, Baltimore, 1905, August). The current ideas of the morbid change have lately been controverted by so high an authority as Kocher, who declares that there is no characteristic anatomical alteration. Without going into details, it may be said that MacCallum's work shows that the thyroid in Graves' disease undergoes changes in alveoli, epithelium, colloid, connective tissue, vessels, and lymphatics, which closely resemble what was produced by Dr. Halsted as a compensatory hypertrophy after partial extirpation. The parathyroids were practically normal in all MacCallum's cases.

"Musset's sign" in exophthalmic goitre.—Paul de Musset was the first to describe rhythmical nodding, synchronous with the pulse, as a symptom in aortic disease. (It is of some interest to know that the subject of the observation was his brother Alfred, the poet). The phenomenon has been noted in aortic aneurysm, in arterio-sclerosis, and now by Zeitner (*Wien. klin. Wchnschr.*, 1905, No. 19) in Graves' disease. The movements have been variously explained as due to arterial reflux, to communicated pulsations from the aortic arch, to tracheal tugging, etc. Zeitner ascribes them simply to the rapid and violent filling and emptying of the arteries of the region of the face and jaw.

Treatment.—The chief advances, or at least novelties, in the treatment of exophthalmic goitre are the employment of various antithyroid sera, and the X-rays. One of the latest workers at the production of a specific serum is Beebe (*Journ. Am. Med. Ass.*, Chicago, 1906, February 17), whose efforts seem to have met with more success than those of his predecessors. The earliest experiments were in the direction of injecting the blood of a myxœdema patient into one suffering from exophthalmic goitre. Next came the use of the serum of thyroidectomised sheep (thyroidectin or antithyroidin), and the milk of thyroidectomised goats. The theory of these remedies is that they contain excess of the toxin which is normally destroyed by the thyroid, and hence neutralise excessive thyroid activity. Another line of attack on the hyperthyroidism which is held to be the cause of Graves' disease, is to use a cytolytic serum, and this so far has had a very limited trial. In summarising the work already done on thyrolytic sera, Beebe speaks highly of Murray's observation (*Lancet*, London, 1905, November 11), but doubts whether, on account of the method of preparing it, Murray's serum (which was found inefficacious) had any inhibitory or cytolytic action at all. In preparing a cytolytic serum, Beebe injects the nucleoproteids, not the whole of the organ. If the latter be injected, it is impossible to obtain a pure specific antiserum, as all such sera have marked hæmolytic properties also. Sera produced by injecting nucleoproteids are, on the other hand, highly specific; thus Beebe has prepared hepatotoxin and nephrotoxin which are active poisons, causing changes in the liver and kidney cells only. In preparing an antithyroid serum, the problem is not merely to get a specific cytotoxin, but a serum which will also neutralise the secretion. Beebe isolated the nucleo-proteids and the thyroglobulin of two glands removed from patients with exophthalmic goitre, and obtained an antiserum by injecting these into rabbits. All antisera made from human organs are capable of doing great damage on man, and hence must be used very cautiously and in small doses only,—not more than 1 c.c.

The clinical value of Beebe's serum is discussed by Rogers in a separate article (*ibid.*). In all, four sets of sera were at his disposal:—

A, made from the fresh thyroids of patients dying from Graves' disease; B and C, made from dried nucleo-proteids and thyroglobulin of the same; D, made from fresh normal human thyroid. The last did not prove of value. Rogers gives the following as a synopsis of the cases treated:—(1) Typical Graves' disease, received a total of 30 minims of serum A when it was fresh, and showed a pronounced local and constitutional reaction about four days after the first dose. Recovery took place gradually, and the condition was practically normal at the end of some four months. (2) Typical toxic exophthalmic goitre, received 15 minims of fresh serum A in one dose, and had a bad cardiac dilatation five days later, but recovered completely during the next three or four months. (3) Severe toxic exophthalmic goitre, received 1 c.c. fresh serum B in four divided doses, with a pronounced reaction four days after the first dose, but has now (five months later) recovered from practically all symptoms. (4) Severe toxic form, also changed from a moribund to a convalescent condition within three days after the administration of 2 c.c. serum B and 2 c.c. serum C when each was about three months old. Seems now to have almost completely recovered. No bad reaction whatever. (5) Typical case, showed similar postponed reaction and slow recovery after a small initial dose of serum C when it was a few weeks old. (6) Typical toxic exophthalmic goitre, received a similar dose of serum C when it was two months old, and, without any noticeable reaction, was changed from a moribund to a convalescent condition, and has now completely recovered. (7) Atypical case, showed severe postponed reaction to serum C when it was a few weeks old, and then recovered gradually. Of the ten cases treated, three are apparently perfectly cured, three were rescued from a critical condition and now approach a cure, while the others are more or less improved. Serum A gave the best results with the smallest doses and the most reaction. The reaction is generally deferred for two to four days, just as are the symptoms in animals poisoned with nephrotoxin. There is also, however, an appreciable improvement in the symptoms immediately after injection, which is probably due to the serum containing an antitoxin, nullifying the effects of the excessive thyreoglobulin. Thus it is supposed that serum prepared in the way described has a double content—a cytotoxin and an antitoxin. Rogers does not suppose that this remarkable serum will cure all cases, as there have been very varied differences in the individual reactions. Generally, the cases with the most marked reaction have progressed most satisfactorily; good is not attained pushing the serum. The difficulty of procuring material for the preparation of Beebe's serum must at present stand in the way of its commercial use. Dr. Rogers' paper concludes by a detailed account of the cases treated, and this bears out his description of his results, which are certainly the most striking yet recorded.

Möbius's serum, obtained from sheep six weeks after extirpation of the thyroid, has been receiving a fairly extensive trial, especially in Germany, but most of the cases recorded have been under observation so short a time that it is scarcely possible to say whether a "cure" has ever been obtained. The serum is too irritating for use subcutaneously: it is therefore given by the mouth. Hempel (*München. med. Wchnschr.*, 1905, January 3) reports one case remaining markedly improved after four months. Thienger (*ibid.*) reports four cases; no benefit in one, in two subjective improvement, in one actual improvement. Lomer (*ibid.*, 1905, May 2) had a good, though temporary, result in one case, and regards the remedy as symptomatic only. Durig (*ibid.*) produced apathy and signs of myxœdema by excessive dosage. His patient did well notwithstanding. Alexander (*ibid.*, 1905, July 18) claims two practical cures and one of great improvement, while Schuler (*Deutsche Med.-Ztg.*, Leipzig, 1905, October 16) saw three cures and two cases much benefited after the drug. It seems, at least, that the preparation is harmless, and it therefore deserves further trial.

SURGERY.

UNDER THE CHARGE OF

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Massage of the Heart in Chloroform Syncope.

Within the last few years fresh interest has been aroused in this subject by the publication of several cases in which some degree of success appeared to follow the procedure. Lenormant of Paris (*Rev. de chir.*, Paris, 1906, March) has reviewed the evidence, both experimental and clinical, and gives his conclusions.

In spite of certain differences of detail, all the experimental evidence goes to show that massage of the heart is capable of re-establishing the circulation in animals after the action of the heart has been arrested for several minutes. In some cases dogs have recovered completely, and have lived for months after the experiment was made.

The author has collected all the clinical cases recorded—twenty-five in number. In twenty-one of these the procedure has been called for in the course of anæsthesia (in one only was ether being used). In the majority of cases there was no gross visceral lesion. Apart from accidents during anæsthesia, massage of the heart has been performed four times: in a case of pulmonary embolism, in tracheal asphyxia, in a case of hanging, and in a case of sudden arrest of the heart during suture of a wound in its wall caused by a bullet.

The technique consists in compressing the ventricles regularly and rhythmically, at the rate of about 30 to 60 per minute. The heart may be reached by the costo-sternal route, or from the abdominal cavity. In some cases the diaphragm has been divided, in others the pressure has been made through the diaphragm, and this the author considers the best method, as it is simpler, more rapid, less mutilating, and the diaphragm being relaxed during the syncope it does not offer any obstacle to the manipulations. In three-fourths of the successful cases compression has been performed by this route.

As regards the results—of the twenty-five cases, patients on whom massage of the heart has been practised, four have been restored to life, that is 16 per cent. The effects of the procedure, however, are better than these figures would indicate, as in other four cases the action of the heart has been restored for a time, although the patient eventually succumbed. In seventeen cases there was no attempt on the part of the heart to resume its action.

Needless to say, the massage of the heart does not supersede other methods of restoring the patient, such as the performing of artificial respiration and the administration of cardiac stimulants. Direct electrilisation of the heart is condemned as not only useless but dangerous. Intra-arterial injection of normal saline solution, in a centripetal direction, is recommended.

In conclusion, the author asserts that massage of the heart is a procedure which is both easy and safe, provided it is performed by the abdominal route without dividing the diaphragm, and that it is indicated in desperate cases of chloroform syncope.

Surgical Intervention in Tuberculosis of the Meninges and of the Brain.

Alessandri of Rome contributes a useful summary of the current views regarding the rôle of surgery in the treatment of intracranial tuberculosis (*Ann. Surg.*, Phila., 1906, February). He excludes at once the great majority of cases of diffuse lesions situated at the base, as beyond the scope of surgery. Of more localised lesions he distinguishes —(1) Patches of tuberculous meningitis, and (2) the so-called "solitary tubercle" of the brain, or "tuberculous gumma"—conditions which may occur independently of one another or in combination. With reference to intervention in cases of "tuberculous meningitis *en plaque*," he points out that this condition consists most frequently of confluent grey granulations of yellowish pseudo-membranes or fibrous scleroses. The seat may be limited to the convexity of the brain, and often to the region of the psycho-motor centres. The great majority of cases occur below the age of twenty. While it is not an event which can in any way be relied upon, it is to be borne in mind that spontaneous recovery from tuberculous meningitis does take place. After excluding a number of doubtful cases, the author quotes several in which the evidence of recovery appears to be satisfactory. At the same time there is always a tendency to relapse, or recrudescence of the disease. Hitherto the attempts to cure this form have been by lumbar puncture or by puncture of the lateral ventricle, with the object of relieving the pressure upon the brain by withdrawal of fluid effusion. They have been shown to be at best only of temporary value. Intraventricular injection of antiseptics, such as iodoform, have been followed by amelioration.

In the case of the localised tuberculous nodule or tuberculous gumma, the conditions are different. A circumscribed, spheroidal swelling forms, usually in the pia mater and in the cerebral cortex. Sometimes it is subcortical. It is a common condition—particularly affecting children. Collected statistics show that out of 1633 endocranial tumours, 489 were tuberculous, and that the frequency is about four times as great in children as in adults. In about 73 per cent. of cases the tubercle nodule is associated with tuberculous meningitis. It is most commonly situated in the pons and basal ganglia, next in the cerebellum, then in the cerebral cortex, and least often in the centrum ovale. It is important to note that these nodules are often multiple—a circumstance which renders the term "solitary tubercle" peculiarly inappropriate. It is in adults that the growth is most frequently single and uncomplicated, and therefore amenable to surgical interference.

A further factor is to be kept in mind—namely, that in a large proportion of cases there are other tuberculous lesions present in the body which contra-indicate any operative treatment for the cerebral condition.

From the records of cases operated upon, it is evident that these growths are capable of being removed, and that a cure may follow. The results are fairly good when the growth is in the cerebrum. In twenty-two cases operated upon, the results were satisfactory in nineteen. The results of operation in cerebellar cases are more discouraging. In six cases, four were immediately fatal, and the other two were only temporarily relieved.

Indications for Operation in Head Injuries.

Writing as a neurologist, Sachs of New York (*Boston Med. and S. Journ.*, 1906, February 15) claims that in serious head injuries the decision whether or not to operate should be based upon neurological, rather than surgical data. In support of his plea he quotes several cases of severe head injuries treated by him on expectant lines with entirely satisfactory results, although, if we may judge from the records furnished, they were cases in which the surgeon would have declined to interfere.

In the discussion which followed Dr. Sachs' paper, Morton Prince pointed out that as a matter of fact in a very large proportion of head injuries serious enough to implicate the brain, there are no neurological signs of a special localised character that give information regarding either the character or location of a lesion. Even the ordinary surgical signs are often deceptive and unreliable; for example, out of 146 cases examined post-mortem, in 31 per cent. of fractures of the middle fossa no hæmorrhage from the ear occurred. In 29 per cent. of all cases there was not only fracture of the vault extending into or through the middle fossa, but the fracture ruptured the branches of the meningeal artery, and death was believed to be due to cerebral compression. Even paralysis does not always indicate hæmorrhage or laceration, as it may be due to œdema, which may subside. The greatest difficulty in determining the exact pathological lesion present, and therefore the advisability of operating, is met with in those cases that are unconscious from the beginning. An interval of normal consciousness is a plain indication, not only that the succeeding unconsciousness is due to hæmorrhage, but that the brain tissue itself was not seriously bruised, lacerated, or otherwise injured by the traumatism. Prince states that "the larger one's experience the more conservative one tends to become in advising operation." This is explained by the great frequency with which laceration is present, and undoes the good which might result from the removal of blood clot. Out of 138 fatal cases, in only 14 per cent. was there no laceration.

Continuing the discussion, and referring to injuries apart from these in which there was absolute evidence of fracture by sight or touch, W. A. Bullard advocates operation in all cases in which unconsciousness comes on after an interval of consciousness; and in adults, whenever unconsciousness lasts more than twelve hours; also when there are persistent unilateral convulsions following injury to the head in adults. Paralysis following immediately after an injury does not necessarily indicate operation.

J. W. Courtney considers that in traumatic cases ordinary neurological indications are most untrustworthy. He has long since ceased to regard the condition of the pupils and of the reflexes as of any special importance. Even a hemiplegia coming on late in a case is extremely misleading as a diagnostic criterion.

Putnam emphasised the fact that œdema of the brain tissue accounts for many of the symptoms in a considerable proportion of cases.

Removal of Supraclavicular Glands in Cancer of the Breast.

As a routine step in the operation of removal of the breast for cancer, Robert F. Weir (*N.Y. Med. Journ.*, 1906, March 3) recommends a simple procedure which admits of exploration of the supraclavicular space without making an extra incision. After the breast has been removed and the muscles resected, by pulling the arm vertically upwards and following the line of the vessels, the finger may be passed well under and beyond the clavicle, and the supraclavicular space behind the sterno-mastoid fully explored. If enlarged glands are found, the usual incision is made above the clavicle for their removal. If nothing is found, a cigarette drain is introduced along the track bored by the finger, and the breast wound closed.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Albuminuria of Pregnancy.

Wallich (*Presse méd.*, Paris, 1906, January) describes two forms of albuminuria during pregnancy: that resulting from the kidneys of

Bright's disease existing before pregnancy, and the true albuminuria gravida resulting from auto-intoxication. The first form is recognised by the albuminuria persisting between pregnancies and the greater tendency to heart symptoms. The albuminuria of pyonephritis is rarer, and recognised by pus in the urine and polyuria. In contrast with the other forms that associated with suppuration is distinguished by the absence of œdema—eye symptoms—placental lesions—epigastric pain—and the tendency to premature birth. Milk diet is essential in all forms.

GROWTH AND CHANGES OF SUBMUCOUS MYOMATA.

Amann (*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, 1906, January) describes the changes which take place in those tumours when allowed to attain great bulk. He reports two cases where the tumours were much larger than a fœtal head. The abdomen in the first case was as large as a six months' pregnancy, and it was impossible to find any trace of the uterus on vaginal examination. Operation showed that the uterus proper was represented by a small protuberance on its anterior wall. In the second case complete invasion of the uterus had taken place, and the tumour was prolapsed outside the vagina. Amann further notes that the appendages are frequently affected by suppurative changes, as the result of absorption from the tumour through the lymphatics; and ulceration on the surface of the tumour frequently causes adhesion to the vaginal wall. Another complication which sometimes takes place is cancerous degeneration of the cervix as the result of long-continued friction against the tumour.

PUERPERAL INFECTION.

Beer (*Wien. klin. Wchnschr.*, 1906, No. 5) reports the occurrence of repeated cases of puerperal fever under the care of an otherwise well-qualified midwife. On careful examination, empyema of the antrum in each upper jaw was discovered, probably the result of influenza. With the cure of this focus of suppuration the cases of puerperal infection ended. Beer believes that the infection may have been conveyed by the use of a handkerchief between the time of disinfection of the hands and making a vaginal examination.

THE PREVENTION OF PUERPERAL FEVER.

Zweifel (*Centralbl. f. Gynäk.*, Leipzig, 1906, No. 1) advocates the removal of all blood clot from the posterior vaginal vault, where it tends to accumulate after delivery. As a result of this precaution, the morbidity at the Leipzig clinic has greatly diminished. The total mortality from sepsis in twelve years amounted to only 0·19 per cent. He believes in the use of indiarubber gloves in obstetric work, and differs from Ahlfeld, who believes in the reliability of rapid disinfection of the hands.

The Treatment of Osteomalacia.

Theilhaber (*Centralbl. f. Gynäk.*, Leipzig, 1906, No. 5) treated the case of a woman, æt. 49, by removal of the ovaries. The pains disappeared for a time, but reappeared later when there was uterine hæmorrhage caused by a cervical polypus. The ovaries removed showed no signs of disease. Theilhaber believes that the beneficial results of castration in osteomalacia are due to an alteration in metabolism. The view expressed by some, that chloroform inhalation may be the cause of the cure is negatived in Theilhaber's case by the fact that ether was the anæsthetic used during operation.

Operative Treatment of Total Uterine Prolapse.

Holst (*Centralbl. f. Gynäk.*, Leipzig, 1905, No. 51) recommends that in women past the menopause, who suffer from total prolapse, the uterus should be removed by supra-vaginal amputation, the stump covered by peritoneum, and then stitched to the abdominal wall. In this way the anterior and posterior vaginal walls are held up higher than in an ordinary ventri-fixation. Any cystocele remaining could be treated by a limited anterior colporrhaphy.

Vaginal Cæsarean Section.

Hofmeier (*Deutsche. med. Wchnschr.*, Leipzig, 1906, No. 5) holds that colpo-hysterotomy should not be represented as a harmless operation. Very alarming hæmorrhage may be caused by deep incisions made into the uterus which has not contracted, uncontrollable by plugging, and necessitating hysterectomy. Hofmeier warns against the present tendency to surgical obstetrics, to the neglect of well-recognised and less dangerous methods of treatment. He admits the value of operative treatment in such conditions as eclampsia and placenta prævia, but favours conservative measures in such conditions as prolapse of the cord.

Post-Mortem Cæsarean Section; Living Child.

Rudaux (*Ann. de gynéc.*, Paris, 1905, December) reports the following case:—P., æt. 28, 2-para, admitted to hospital a short time before labour was due. The urine had always been normal. Cæsarean section was performed, and a living child extracted. A few days later she died suddenly. Post-mortem examination showed congested lungs, and a large clot in the right ventricle, extending into the infundibulum. There was nothing abnormal found in the brain, nor did the uterus present any lesion.

Suppurating Dermoid Cyst of Ovary discharging into the Bladder.

Barnsby (*Gynéc.*, 1905, December) reports the following case:—P., æt. 38, known to have had an ovarian cyst during a previous pregnancy, with all the signs of torsion of the pedicle; declined operation. Eight weeks later, Barnsby had to perform an emergency operation on account of the patient's exhausted state. In the course of the operation the tumour was found universally adherent, suppurating and communicating with the bladder. The appendix was adherent to the cyst. There was also a large uterine fibroid and left-sided hydro-salpinx. The cyst and appendix were removed, the opening into the bladder stitched up, and the uterus removed by supra-vaginal hysterectomy. Complete recovery.

THERAPEUTICS.

UNDER THE CHARGE OF
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Nitrite of Amyl in Hæmoptysis.

Pit and Petitjean have an interesting article on recent work on the vasomotor influence of drugs on the pulmonary circulation. They point out that the effect of a drug upon the pulmonic circulation frequently differs from its action upon the general arterial system. Thus digitalis has but little action in raising the blood pressure in the pulmonic circulation, while the influence of ergot is still under dispute. Adrenalin seems to exert only a slight constringing influence on the pulmonary blood vessels. Even direct injection of adrenalin into the parenchyma of the lung is incapable of arresting hæmorrhage from a cut made into the injected area. Thus of all the drugs reputed to have constringing action upon the lung vessels, none can be said to be reliable. Recently amyl nitrite has been recommended in hæmoptysis. Its action was supposed to be indirect, and to depend upon general reduction of the blood pressure. Pit and Petitjean find, however, that in addition to its dilating action on the general system, nitrite of amyl causes constriction of the vessels of the lung. If the lung is exposed, it will be seen to become blanched. The normal rose tint disappears, and is replaced in parts by white anæmic patches, which spread and coalesce so as to include all or nearly all the lung tissue. This action commences in from one half to three minutes after injecting the drug into a vein, and lasts for about eight minutes. The hæmostatic action is so great that if at the moment when the intravenous injection is made, an incision into the lung parenchyma is made, the abundant hæmorrhage which results from the injury is checked as if the torn vessel had been ligatured. In another series of experiments the pressure inside the pulmonary artery was measured. It was seen that the pressure rose very rapidly after an injection of the nitrite. The rise lasted for ten minutes. In both sets of experiments the dogs were curarised, and received artificial respiration while the thorax was opened and the lungs exposed. The authors claim that in addition to the vaso-dilating influence on the larger circulation, the nitrites cause vaso-constriction of the lesser circulation. This latter action may be made use of in the treatment of certain cases of hæmoptysis, where a prompt action is necessary. It may be used in the congestive hæmorrhage of the early stage, or bleeding from pneumonic infiltration round cavities in later stages. It is more doubtful whether it will act successfully in bleeding from an aneurysm.—*Lyon méd.*, 1906, No. 7.

CALCIUM SALTS AS A MEANS OF PREVENTING SERUM RASH.

NETTER has found that the administration of chloride of calcium prevents the appearance of serum rashes. He tested the action in a series of 516 children who received serum treatment in diphtheria. The cases were divided into two equal portions. The first lot of 258 children received calcium chloride. On the day of injection 1 grm. was administered, and this amount was repeated on the two following days. Serum rash was noted in 6 per cent. of this series, whereas in the other set of cases which received no calcium chloride, the number that subsequently showed the rash was 40 per cent.—*Arch. gén. de méd.*, Paris, 1906, No. 8.

VERONAL POISONING.

VERONAL is stated to be non-toxic, but Ehrlich reports two cases in which death occurred from large doses of veronal. In the first case, a man, æt. 57, suffered from melancholia and chronic intestinal catarrh. He succeeded in procuring 1 oz. of veronal, which he swallowed, with suicidal intent. The patient became comatose, with marked cyanosis and shallow breathing. The respiration ceased every now and then, and there was retching. The pupils were contracted to pinpoint size, and did not react. The pulse was feeble and averaged about 90 beats per minute. The condition resembled that of profound morphine poisoning. The patient died in twenty hours, without recovering consciousness. In the second case 11 grms. of veronal caused death in twenty hours.—*München. med. Wchnschr.*, 1906, No. 12.

OSMIC ACID INJECTIONS IN NEURALGIA.

EASTMAN has used injections of osmic acid with some success in neuralgia. He finds subcutaneous injection of little use. The nerve trunk should be exposed, and the drug, in the form of a 2 per cent. solution, should be directly injected into the nerve. Ten drops of this solution may be injected into sensory nerve trunks without danger, though patients suffering from kidney mischief may show signs of renal irritation. The mechanical stretching of the nerve incidental to the injection supplements the good effects of the acid. In the case of small nerves, it is difficult to inject directly into the nerve trunk. In such cases the nerve should be clipped so that the end may be bathed in the osmic acid solution, and all the fibres brought into contact with it. It is advisable to employ a general anæsthetic, so that, if required, neurectasy or section of the nerve may be performed. Though the action of the osmic acid injection is somewhat uncertain, a large proportion of cases are relieved for months, and the injection can be repeated in a few months if required. The relief of pain is not immediate, but may take from one to two weeks to come on. The solution should be freshly prepared. Experiments on animals showed that the injection caused no change in the nerves except disintegration of the fat and oil globules in the perineural space, and in the white matter of Schwann, which act merely as protectors and insulating matter for the essential part of the nerve. Any degeneration in the nerve may fairly be ascribed to nutritional changes indirectly resulting from the selective action of osmic acid on the fat. As there is no reason why this fat should not be reproduced, the nerve may again become capable of transmitting sensation, *i.e.* the neuralgia may recur.—*Journ. Am. Med. Ass.*, Chicago, 1906, February 24.

SPINAL ANÆSTHESIA WITH STOVAIN.

FINKELNBURG (*München. med. Wchnschr.*, 1906, No. 9) gives the results of the careful observation of some fifty cases of spinal anæsthesia induced by stovain. Hitherto accurate observation on human beings have not been made. The observations were made on patients operated in the surgical clinique in Bonn. The technique is as follows:—With the patient in the sitting position, the needle is introduced in the middle line between the first and second or the second and third lumbar vertebræ. No mandrin is used. Several syringefuls of cerebro-spinal fluid are withdrawn, and then 0·04 to 0·06 grm. stovain, mixed with 0·11 per cent. sodium chloride and 0·01 per cent. of adrenalin, is injected. Then, depending upon the nature of the operation, the patient lies in the horizontal position or the pelvis is raised. The accurate introduction of the needle in the middle line is insisted on, as deviation to one side may lead to one-sided anæsthesia from interference with the diffusion of the drug. After a properly carried out lumbar injection, there should be no pain except from the passage of the needle through the skin. At the end of the first minute with the patient in the horizontal position, the first symptom is a slight diminution in the sensitiveness of the scrotum to pain, spreading to the anal region and on the inner surface of the thighs. Tactile sensation and power of localisation are at first retained. Almost simultaneously there is a distinct weakening or even abolition of the knee-jerk. Abolition of the knee-jerk after one minute may be taken as an absolute indication that the subsequent anæsthesia will be satisfactory. Within the second minute the Achilles tendon reflex disappears. With elevated position of the pelvis the analgesia has usually spread up to the level of the navel. Neither tactile sensation, thermal sensitiveness, nor power of localisation are affected at this stage to any marked extent. They are implicated relatively later during the fifth minute. The cutaneous reflexes disappear in the fourth to fifth minute, the abdominal reflex persisting after the disappearance of the plantar. From the fourth to the sixth minute some motor disturbance appears, shown first in slight difficulty in moving the toes and feet. Almost concomitant with the paresis of the legs, weakness of the abdominal muscles becomes evident, so that the patient is unable to raise himself from the dorsal position without the aid of his arms. At the end of five minutes there is complete analgesia of the legs and of the body up to a horizontal line at the level of the fifth or sixth rib. The tactile sensibility is usually much affected, as is also the appreciation of temperature and localisation, but the power of judging the position of the limbs persists longer, and may be but little affected. With regard to the deeper structures, those innervated by the sacral nerves are analgesic. On the other hand, it is difficult to obtain a good analgesia of the scrotum and spermatic cord, as the nerves supplying these parts are branches from the genito-crural, which comes from the first lumbar segment. The same holds true for the peritoneum, as the visceral portion is supplied by branches from the vagus and phrenic nerves, and in addition from the sympathetic through the splanchnic, which receive medullated branches from the fourth to the ninth costal nerves. The duration of anæsthesia varies considerably. As a rule, the sensation commences to return after forty-five to sixty minutes. The return of the various sensations occurs much more slowly than they disappear. The order of return is, first, motion, then sensation, lastly the reflex action reappears. It appears, therefore, that the action on certain nerve elements is more pronounced, thus the reflex is more sensitive than the motor and sensory tracts, while there are distinct differences in the varying implication of the special sensory systems. After effects are not common. Occasionally there is a period of increased reflex activity. In other cases slowing of the pulse was noted in from one-half to three-quarters of an hour after injection, and persists for two hours or so. The blood pressure is not affected. The temperature may be raised for a few days afterwards.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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On the Properties of Anti-immune Bodies and Complementoids.

Muir and Browning (*Journ. Hyg.*, Cambridge, 1906, January), in an interesting paper on this intricate branch of immunity, come to the following conclusions:—

A. *With regard to the hæmolytic dosage of complement in different media.*—(1) The dosage of complement varies greatly according to the medium in which the red corpuscles are suspended. (2) The most striking variation observed was the very high dose of guinea-pig's complement necessary to produce lysis of the red cells when ox's corpuscles are suspended in guinea-pig's serum 55°, a dose which is about six times the dose necessary in salt solution, and about three times the dose in ox's serum 55°. (3) The high dose of complement necessary is chiefly due to the complement being prevented from entering into combination with the corpuscles heated with immune body. (4) When the complement in guinea-pig's serum is removed by combination instead of being converted into complementoid by heating at 55° C., the dosage of complement in such a heated serum is much diminished, and becomes approximately the same as in ox's serum 55°. (5) We conclude that the presence of a large amount of guinea-pig's complementoid interferes with the combination of complement, and the dose of the latter necessary for lysis is thus increased.

B. *With regard to anti-immune bodies, those studied by hæmolytic methods.*—(1) The anti-immune body obtained by injecting the normal serum of the rabbit was shown to act in two immune bodies produced in the rabbit by active immunisation, and the corresponding anti-immune body obtained by injecting guinea-pig's serum was shown to act in two natural immune bodies in the serum of that animal. (2) The anti-immune body is shown by quantitative experiments not to interfere in any way with the combination of immune body with the receptors of the red corpuscles. (3) The anti-immune body combines with red corpuscles treated with immune body and interferes with the combination of complement. Lysis may thus be prevented by the anti-immune body; but where this is not the case it is shown by quantitative methods that a certain amount of complement is kept out of combination. (4) The natural immune bodies of the serum injected combine directly with the anti-immune body developed, and have also the power of dissociating anti-immune body after it has combined with immune body fixed to red cells. The combination of anti-immune body is a comparatively weak one, and belongs to the group of reversible actions. (5) We have been unable so far to demonstrate that the previous combination of complement prevents the union of anti-immune body with red corpuscles treated with immune body.

SOME EXPERIMENTS WITH "STIMULINS."

LEISHMAN (*Trans. Path. Soc. London*, 1905, March 21) gives the conclusions he was led to form from a number of experiments designed to determine what influence was exerted on the phagocytic power of normal leucocytes by the addition to the blood of a small quantity of immune serum. He adopted the name "stimulins" for the substances in immune serums, which bring about the increased phagocytosis, because of the experiments of Metchnikoff, Gengou, Klemperer, and others, which showed that the introduction of serum, sometimes normal, sometimes immune, into the serum sacs of experimental animals caused a greatly increased phagocytic activity in the leucocytes of the exudation subsequently removed from the sac for examination. To the substances which these observers conceive to be present in such serums, they gave the name "stimulines," and to the presence of these stimulines in immune serums Metchnikoff and his school attributed an important rôle in the processes of both active and passive immunisation. He refers to Wright and Douglas's work on *opsonins*, which demonstrated that, in the case of most of the germs investigated by them, the phagocytic power of the leucocytes was dependent upon the manner in which the germs had been acted upon by certain substances contained in the blood fluids, to which they gave the name of *opsonins*. These opsonins are specific, and destroyed by heating to a temperature of 60° C. for ten minutes. Some of his experiments were therefore designed to determine whether opsonic action played any part in the mechanism of the stimulin effects obtained by him. All the serums employed in them were heated to 60° C. for ten minutes, and therefore contained no active thermolabile opsonins. He summarises his general results as follows:—(1) Serums derived from cases of Malta fever or enteric fever, or from animals immunised with living cultures of the germs of these diseases, contain substances which, when added to normal human blood, are capable of increasing the phagocytic activity of the leucocytes of that blood. (2) These substances are specific; *i.e.* they will only induce increased phagocytosis of the germ which has been used in immunisation. (3) The substances are thermostable, withstanding a temperature of 60° C. maintained for fifteen minutes. (4) No evidence of the presence of these substances could be found in the serums of normal men or animals. (5) Although the increased phagocytosis may in some part be due to the presence in the serums of agglutinins or of immune body, the substances in question do not appear to be identical with these. (6) One experiment suggests that these substances act directly upon the leucocytes and not upon the bacilli. In subsequent discussion, Dr. Wright said that Metchnikoff is inclined to abandon the term "stimulines," and to adopt in preference the term *sensitisers* or *opsonic sensitisers*. Dr. Wright thought that the substances whose action was demonstrated by Major Leishman's experiments might possibly be thermostable opsonins—that is similar in their mode of action to opsonins, but differing from them in being thermostable. Further experiments are necessary before the substances can be labelled with a distinctive name and before it can be said whether they act on the leucocytes or upon the bacilli.

ON THE BEHAVIOUR OF LEUCOCYTES IN MALIGNANT GROWTHS.

FARMER, Moore, and Walker (*Trans. Path. Soc. London*, 1905, July) describe certain phenomena which appear to be mainly, if not entirely, restricted to cancer in its earliest stages, and not to occur in older growths, in metastases, or in grafts introduced into other individuals. The observations refer to—(1) A small primary rectal tumour; (2) an early case of chimney-sweep's cancer; and (3) an epithelioma of the penis. In all of these the essential details in relation to the behaviour of the leucocytes are identical, and suggest cytological phenomena peculiar to the earliest phases of the transmutation of normal tissue cells into cancerous elements. The rectal carcinoma was about the size of a bean.

It showed that there was a very distinct zone of transition from the normal to the cancerous elements round the periphery of the tumour—"that is to say, a zone in which it was possible to pass, within the thickness of a few cells, and almost insensibly, from elements that were merely actively dividing in the mucous layer to cells that had assumed most markedly malignant characters." In this, and in other cases, "they were irresistibly driven to the conclusion that the growth had not originated from a single cell, or even from a few cells, but was being evolved by the direct conversion of a great many elements definitely functioning as mucous cells into those of a truly malignant type." Immediately within this outer zone of the tumour the leucocytes were present in greatest number, and some of them had invaded the cytoplasm of the epithelium. This did not occur in the adjacent healthy tissue, nor in tissue artificially inflamed. Neither the invading leucocytes nor the invaded tissue cells appears to be injuriously affected. Neither appears to be eventually destroyed, and many epithelial cells which were in stages of active division contained leucocytes that had been engulfed in their cytoplasm. Both might be dividing mitotically in a similar manner at the same time, the spindle figures becoming in some cases confused as is ordinarily the case in the first cleavage of the ovum. They think that a mixture of the chromosomes derived from the leucocyte and tissue cell respectively, is distributed between the daughter nuclei resulting from the mitosis. "In this way a complete disturbance of the normal chromosome constituents of the cell will be effected, and the distribution must be of a qualitative as well as of a quantitative character."

The Pathological Histology of Hereditary Syphilis and its Relation to the Spironæma or Spirochæte Pallida.

Levaditi (*Ann. de l'Inst. Pasteur*, Paris, 1906, January 25) examined the organs of six cases of hereditary syphilis, either still-born or succumbing some time after birth. He found that the organs are affected in the following order: the liver, the lung, the suprarenal capsule, and the skin; that the degree of morbid change was in direct relation to the number of spirochætes present; that the organs, like the brain, kidney, etc., showing little morbid change, were practically free from the spironæma. The suggestion that the spironæma was a secondary invasion, having nothing to do with the pathogenesis of syphilis, was thus a most unlikely one. In the acute cases proving rapidly fatal, the parasites are widely distributed through the body; in the chronic cases they are restricted to the organ chiefly affected, namely, the liver. This localisation explains the evolution of a hereditary syphilis exclusively visceral, the skin and mucous surfaces being healthy. The liver, connected as it is with the placenta, is the first organ affected. The parasites travel by the blood vessels, quickly leaving the lumen and settling in the vascular walls, there multiply and thence invade cells, chiefly the glandular cells of the liver, kidney, suprarenal, and probably also of the sweat glands. He believes that the degenerative changes in the secreting cells, the peri- and endo-arteritis and the fibrosis, are due more to the invasion of the parasite than to any soluble substances it may excrete. Maceration he looks upon as an autolytic or fermentative process only occurring in a fœtus dying *in utero*, as a result of hereditary syphilis. The maceration is in no way caused by the parasites, which can be demonstrated to be still present in organs whose elements have been profoundly altered by maceration. The last observation of interest in his paper points to the mechanism by which the fœtal tissues defend themselves against the attack of the parasite. A high degree of phagocytosis occurs, *e.g.*, in the pulmonary epithelium, and the parasite can actively penetrate only such cells as do not possess phagocytic properties, *e.g.*, the liver cells.

DISEASES OF THE EAR, NOSE, AND THROAT.

UNDER THE CHARGE OF

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THE SERUM (POLLANTIN) TREATMENT OF HAY FEVER.

THE results of the treatment of hay fever by the use of Dunbar's antitoxin are so varied, that it is almost impossible to draw any conclusions as yet regarding its therapeutic value. Those who are acquainted with what we may term the vagaries of hay fever, can appreciate the difficulty that we have in estimating the value of any form of treatment that is suggested for the relief of this distressing affection. There are individuals who suffer severely one season, while in the following year they remain comparatively free from symptoms; on the other hand, we find other patients suffering from a well-marked type of the disease, while their neighbours remain more or less free from attacks. Under such circumstances, therefore, it is difficult to gauge the real value of any drug that is prescribed. Again, the irritating influences are so varied, that what may serve as a suitable antitoxin for one individual is useless for another.

A number of observations have now been made upon the use of Dunbar's serum, and the published results of these show very considerable diversity of opinion regarding its efficacy. Perhaps the following sentences, extracted from a paper by MacCoy (*Trans. Am. Laryng. Ass.*, 1905), will give the reader some idea of the position of this question at the present moment:—"In attempting to formulate any conclusion from two seasons' trials with two different sera—that is, the serum of 1903 and 1904—one can but infer that matters are still *sub judice*. The prestige of 1903 was greatly hurt by the percentage of failures in 1904. We are warranted in the belief, from two seasons' experiences, that the toxins reacting in the large class of graminaceæ are not identical with toxins found in certain American weeds; that two sera or more, or a composite serum, will be required to cure or correct the etiological factors of hay fever." MacCoy writes in an optimistic manner regarding the future of the serum treatment of hay fever, provided always that the proper sera are used in individual cases.

Knight of New York furnishes some facts regarding the use of the antitoxin, and also criticises this line of treatment (*Med. Rec.*, N.Y., 1906, March 10). The following figures are compiled from the reports of eighty-one physicians in different parts of the United States:—The total number of cases was 219; of these 114 were effectively benefited, sixty-six were partially benefited, while thirty-nine were not influenced by treatment. In observing a disease so baffling and protean as hay fever, writes Knight, we encounter many confusing factors. The psychic element in many cases should not be overlooked, since otherwise we may be led to most erroneous conclusions as to the effect of remedies. A case in illustration has recently been reported, in which the individual, having tried every known remedy for hay fever without avail, in despair resorted to Christian Science. At about the time his letter of application for "absent treatment" should have reached its destination his symptoms began to abate, and the next day had practically disappeared. While he was comparing the present result with those under the ministrations of orthodox medicine, he received a message from the priestess of the faith, announcing that she was away when his letter arrived, but would begin treatment at once. His idol having been shattered, all the hay fever symptoms recurred with original intensity.

From a study of reports on this subject, a final decision as to the value of serum treatment does not yet seem warranted. The discrepancies and sources of error are so manifold, that it is by no means easy to solve the problem. One observer carefully follows directions as to hygiene and régime, while another disregards them entirely. One employs various agents in conjunction with the serum, while another discards all other medication. One records a dismal list of failures, while another claims success in more than half his cases. Lack of uniformity in the preparation and use of the remedy, as well as in the general management of the patient, may perhaps explain in part the prevailing diversity of opinion. The strength of the serum, and the sources whence it is obtained, no less than care and moderation in its administration, are important points. From the mass of experience and literature now accumulating, we may soon expect to arrive at a just estimate of its value. In the meantime experiments with the serum may be continued, with the assurance at least that it does no harm, even though it gives results no better than those acquired by other methods.

INTRACRANIAL LESIONS IN CHRONIC PURULENT OTITIS MEDIA.

ALLEN STARR of New York (*Med. Rec.*, N.Y., 1906, March 10) makes some interesting observations in connection with the diagnosis of intracranial complications consequent upon middle-ear suppuration. While there are symptoms which are generally recognised as diagnostic of cerebral abscess, they are not invariably present. Some may be absent, while great variations in each of the symptoms may be observed in different cases, so that no one of them can be declared as pathognomonic of abscess. Any means, therefore, which will throw additional light upon the diagnosis must necessarily be of value. The examination of the cerebro-spinal fluid by lumbar puncture and the examination of the blood are two methods which deserve attention in this connection.

The cerebro-spinal fluid in a normal state contains only one or two leucocytes. In meningitis the number of leucocytes is enormously increased. It should be stated here that in syphilitic patients the leucocytes are increased, being as high as 80 in tabes, and from 20 to 60 in cerebro-spinal syphilis. In general meningitis as many as 100 have been found, while in tuberculous meningitis the leucocytes have reached nearly 1000. On the other hand, this is not true of cerebral abscess. In a number of cases collected by Starr during the last few years, he has failed to find any record of an increase of the leucocytes in the cerebro-spinal fluid, except in those cases where a complicating meningitis was present. These cases have been collected from many sources, and may be regarded as reliable. Consequently an examination of the fluid serves as a valuable differential point between abscess and meningitis. The presence of micro-organisms, too, in the cerebro-spinal fluid gives an important indication of the presence of meningitis, though, as we have shown elsewhere, organisms may be found in the cerebro-spinal fluid without being pathognomonic of meningitis.

The examination of the blood is also of value in these cases. While any inflammatory state like that present in otitis media acuta is likely to increase moderately the leucocytes in the blood, a very great and sudden increase in their number is a very valuable indication of a fresh inflammatory complication. Thus in a case of chronic otitis media we may find 8000 to 10,000 leucocytes, but if a meningitis or a brain abscess develop, the number rises to 20,000 or even 35,000. But possibly we may go a step further, and say that there is a more rapid rise in the number of leucocytes and a higher leucocyte count in meningitis than in brain abscess. Thus in two cases observed by Starr in which these two conditions progressed simultaneously, and in which the nature of the lesion was proved by autopsy, the following points were noted. In the case of meningitis, the leucocyte count on the second day of the disease was 9000, on the third day 11,000, and then rose on the fourth day to 22,000, remaining between that and 26,000 until death. In the case of the brain abscess, the number rose slowly from 9500 on the third day up to 14,000 on the eighth day, but never went above 15,000 up to death, which occurred one month after onset.

There is yet another fact elicited by a blood examination. A rapid rise in the ratio of the polymorpho-nuclear leucocytes to other elements in the blood has been observed in the cases of acute inflammation. Usually such a rise is to be watched for, and if the ratio changes from 65 or 70 per cent. up to 75, 80, or 85 per cent., the probability of a cerebral complication is very great. In a case of mastoid complication observed by Starr four weeks after the operation, symptoms suggestive of cerebral complication arose. The diagnosis of intracerebral thrombosis was suspected. A slowly increasing leucocytosis, however, was observed, from 9000 up to 15,500, and an increase from 75 to 85 per cent. in the polymorpho-nuclear bodies. This fact confirmed the suspicion that a brain abscess was forming, and an operation proved this to be the case.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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Milk and Epidemic Diarrhœa.

Dr. J. E. Sandilands (*Journ. Hyg.*, London, vol. vi. No. 1), in a paper dealing with epidemic diarrhœa of children, considers the subject of its causation from several points of view, as bearing on "a widespread belief in a more or less intimate relationship between the high bacterial content of milk sold in large towns and the prevalence of diarrhœa among those who consume it." Confirming the observations of Newsholme in Brighton, he found that condensed milk is a more potent source of diarrhœa than cows' milk. He made inquiries as to the feeding of 554 healthy infants, during the first nine months of life, in the borough of Finsbury, and as to the diets of all children dying from diarrhœa before the age of nine months in that borough during the years 1903 and 1904, with the following results:—

	Diet.					
	Condensed Milk.	Cows' Milk.	Artificial Foods.	Total Artificial.	Human Milk alone.	Totals.
Deaths from Diarrhœa—						
Number . .	44	63	10	117	22	139
Percentage . .	32	45	7	84	16	100
554 *Healthy Children* (*under* 9 *months*)—						
Number . .	56	105	11	172	382	554
Percentage . .	10	19	2	31	69	100

From this it appears that "infants fed on 'condensed milk' are three times more liable to fatal diarrhœa than they should be, on the assumption of an average distribution of the disease irrespective of diet, whereas the liability of infants fed on cows' milk is less than two and a half times the average."

Five experiments with different samples of Nestlé's condensed milk, which was the brand stated to have been used in 90 per cent. of the fatal cases in Finsbury, were made, and Dr. Sandilands found the bacterial content remarkably low, and remaining low for a week or more at a temperature of 70° F. He is of opinion, judging by laboratory experiment, that "even in a hot summer the contents of a tin will have been consumed before large numbers of bacteria have developed, and before decomposition has set in." As regards the bacterial content of cows' milk in relation to epidemic diarrhœa, he states that about 50 per cent. of the infants dying from diarrhœa in Finsbury were stated to have been fed on cows' milk "boiled in bulk on delivery and used as required." The incidence of diarrhœa is greatest in the poorer districts, where, speaking broadly, the bacterial content of the milk is highest; and since both rich and poor alike boil their milk, the immunity of infants of the wealthier class can only be attributed to the low bacterial content of the milk, *if we ignore the operation of home influence.*

It is to home infection of milk and to the distribution of the contagium of the disease by flies that Dr. Sandilands attaches the greatest importance. In winter, when flies are absent, he considers that indirect personal infection may occasionally take place by the hands of a dairywoman whose infant is suffering from diarrhœa, and in other ways which must be excluded before we finally accept the possibility of an impersonal origin of the disease.

In the poorer tenement districts with common yards, the flies flit in and out of the open windows, conveying infected excrement to the milk used for feeding infants, or depositing the infected excrement on the dust-bin, etc., to be carried by other flies in a similar manner to infect milk. Ballard, as he points out, laid great stress on the keeping of food in improper surroundings exposed to the emanations from accumulations of domestic filth, circumstances in which the food would often undoubtedly be in the midst of swarms of flies. Briefly, Sandiland's conclusions are that—(1) In proportion to the number of consumers, condensed milk (Nestlé's), with comparatively few bacteria, is more frequently associated with diarrhœa than cows' milk, in which the number of bacteria is phenomenally high. (2) In certain seasons cows' milk may be exposed to temperatures favouring high bacterial content, and yet not be a frequent source of diarrhœa. (3) The number of bacteria in cows' milk, whether natural or preserved, has no direct influence on the incidence of diarrhœa. (4) The majority of cases of diarrhœa are due to consumption of food (milk) infected in the district in which the cases have occurred. (5) The infective matter is generally the excrement of some one suffering from diarrhœa. (6) The life-history of house-flies, and the ease with which they can convey infected fæcal excrement to food, suggest that the seasonal incidence of the disease coincides with and results from the seasonal prevalence of flies.

DISINFECTION OF STABLES, ETC.

DR. P. PAGNINI (*Riv. d'ig. e. san. pubb.*, Roma, 1905, p. 507) gives some interesting results obtained by him, comparing the relative value of various solutions for disinfecting the walls and floors of stables, cattle-sheds, etc. In determining the value of the various solutions, he made use of the method of washing by means of a sterilised sponge dipped in sterile distilled water a definitely measured area of wall or floor, and subsequently cultivating the water squeezed from the sponge on agar plates. He experimented with four solutions, namely—(1) 10 per 1000 corrosive sublimate solution, containing 25 per cent. hydrochloric acid; (2) 5 per cent. Laplace mixture (a solution of phenol-sulphuric acid); (3) 5 per cent. carbolic acid in 2 per cent. soap solution; and (4) caustic soda 5 per cent. solution. The following table shows the results obtained:—

Number of Colonies.

	Before Disinfection.	24 hours after.	36 hours after.
Solution (1) . .	11,800	12	25
,, (2) . .	10,040	280	352
,, (3) . .	9,750	810	500
,, (4) . .	18,875	5	7

The remarkable power of caustic soda solution as a disinfectant in such circumstances is very striking. It seems rapidly to dissolve viscous material on which it is difficult sometimes to attack micro-organisms. It has also the additional recommendation of cheapness as well as that of being non-poisonous. The soda solution is prepared fresh according to the method of Ottolenghi, which is as follows. Into a large iron can put quicklime, slack it with water, and to the milk of lime so prepared add boiling solution of washing soda. Mix all together, and allow to stand for from one to two hours, when two layers are formed, the lower layer consisting of slaked lime and carbonate of lime, and the upper liquid contains the caustic soda in solution. To make 1 litre (about 36 oz.) of this wash from 3 to 3½ oz. of quicklime and about 8 oz. of washing soda (carbonate of soda) are necessary. In Pagnini's experiments the actual strength varied from 4·8 to 5 per cent. of caustic soda.

Municipal Milk Supply.

Dealing with the question of municipal milk supply, Parkes (*Pub. Health*, London, vol. xviii. No. 7) discusses some points of importance as to the best methods to be aimed at for the supply of milk to the infant population. The main objections to the system of supply at present in operation, he considers, are the following:—(1) The reliance for the supply of milk on a farmer or dairyman whose operations as regards milking, straining, cooling, storage, and transit of milk cannot be efficiently supervised. (2) The necessity under these conditions of supply of sterilising or pasteurising the milk at the depôt before distribution in order to prevent, especially in hot weather, the milk becoming sour and unsaleable. In this relation he is against such treatment of milk, as "it tends to the injury of the milk both in appearance and nutritive qualities." The heating of the milk to the temperature necessary to destroy the bulk of the micro-organisms causing fermentation and putrefaction produces the greatest change; but the objection, he considers, holds good, though in less degree to pasteurisation, and that "the desideratum is to supply infants with fresh new milk, that is, free from preservatives, and that has not been heated, and modified so as to resemble human milk in its composition and constitution, according to the age and condition of the infants to be fed." (3) The third objection is the cost of existing systems, especially where small quantities are dealt with. This results from the manipulation necessary for the modification, pasteurisation, and bottling. The aim should be to produce milk and to distribute it under such conditions that sterilisation and preservation are unnecessary. As this can only be done when the dairy farms are under municipal control and management, he suggests that the London boroughs should combine and establish one, or possibly two, dairy farms in the neighbourhood of London. The milk produced should be cooled, modified, and bottled at the farms. The borough depôts would then act only as distributing centres, to which the prepared milk would be sent in suitable cold-storage vans, preferably motor. Under such a system the milk could be kept at a temperature sufficiently low to prevent any multiplication of germs from the time its was drawn till handed over the counter. The farms must be within driving distance (horse or motor) of London, to avoid the milk passing into the hands of railway companies, who are not concerned in the prevention of its deterioration.

REPORTS OF THE MEDICAL SOCIETIES.

Glasgow Pathological and Clinical Society.—*April* 9, 1906.—Dr. Lindsay Steven, Vice-President, in the chair.—Mr. A. Ernest Maylard described a case of malignant disease of the duodenum surrounding the orifice of the common bile duct. The patient, a man, æt. 39, was admitted to hospital suffering from jaundice, with a history of the commencement of the illness, some months previously, with fits of shivering, sense of prostration, and subsequent yellowness of the skin. On admission, in addition to the obstructive jaundice, marked pallor was noted; there was no pain or tenderness, but a sense of resistance was elicited in the region of the gall bladder. Three weeks after admission an exploratory laparotomy was performed, and the distended tense gall bladder opened and drained. No gall stones were found, but in the second part of the duodenum a somewhat movable tumour, apparently indicating the head of the pancreas and common bile duct, was found. A biliary fistula persisted, the jaundice became less marked, and the general condition of the patient improved. Some weeks later he suddenly collapsed and died. The post-mortem examination, performed by Dr. Anderson, showed a spherical carcinomatous ulcer of 2 in. in diameter in the second part of the duodenum, involving the bile papilla, but the diverticulum of Vater was not occluded. The common bile duct above its relationship to the head of the pancreas was dilated, and dilatation of bile ducts in the liver was also noted. The glands at the head of the pancreas were enlarged, and evidently malignant.—Dr. T. K. MONRO showed a specimen of aneurysm of the splenic artery, from a case of ulcerative endocarditis. The patient, a young man, æt. 23, was admitted suffering from breathlessness on exertion, weakness, pain in chest and legs. During his residence he suffered from arthritis of the knees and irregular pyrexia. The heart was enlarged, and at the apex A.S., V.S., and V.D. murmurs were heard, and at the other cardiac areas V.S. and V.D. murmurs. At the post-mortem examination, an enlarged heart, with vegetations on the aortic, mitral, and tricuspid valves, was found. Infarctions were present in the spleen, and the splenic artery, at its point of entrance into the organ, showed the presence of an aneurysm the size of a Tangerine orange, filled with blood clot.—Dr. A. M. RAMSAY and Dr. HUGH WALKER gave a report on a case of tuberculosis of the uveal tract, and showed microscopical preparations from same. The patient was healthy up to six weeks before his admission to hospital, when he began to suffer from what he called "inflammation of the eye," and latterly of a swelling at the upper aspect of the corneo-scleral junction of a soft and yellowish white appearance, and the conjunctiva covering it was traversed by large varicose blood vessels. There was a very bad tuberculous family history. The eye became worse during residence in hospital, and was enucleated. In addition to the extra-ocular mass, a large-sized intra-ocular tuberculous tumour was present.—Dr. JOHN PATRICK showed two brothers who suffered from mal-occlusion of the jaws. The only teeth which approximated were the back molars; the teeth of the lower jaw were somewhat larger, and externally situated to those of the upper jaw; while there was present a very high arch of the palate.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.—*April* 6, 1906.—Dr. T. K. MONRO showed a patient with syringo-myelia. The patient, a male, æt. 31, had suffered from the disease for ten years. The right arm was wasted, especially the muscles of the hand. Sense of pain was lost over an area extending from the middle line of the chest in front along the right costal arch, over the right side of the back as low as the ninth dorsal spine, and on the right side of the face and neck. Thermal and muscular sense were also lost.—Dr. T. K. MONRO described the clinical features, and Dr. HUGH M'LAREN the pathological conditions, found in a second case of syringo-myelia.—Dr. T. K. MONRO and Dr. A. N. M'GREGOR showed a patient on whom the operation of epiplopexy was performed seven months ago for cirrhosis of the liver and ascites, with satisfactory results. The abdomen was opened in the middle line above the umbilicus, and the omentum sutured to the anterior abdominal wall on either side. The healing of the wound was followed by distension of the left superficial epigastric vein.—Dr. W. F. SOMERVILLE read a paper on "The Influence of High-frequency Currents on the Surface Temperature of the Body." An illustrative lantern demonstration was given.

Forfarshire Medical Association.—*April* 6, 1906.—Dr. Sinclair, President, in the chair.—Mr. Greig showed a man, æt. 68, after operation by evagination of the testicle for large double hydrocele. Mr. Greig also showed an infant who had at birth an occipital meningocele larger than its head. The cyst collapsed at birth, but soon refilled, and at the age of 5 weeks he successfully removed the tumour. A third case shown by Mr. Greig was one of morphœa of the right forearm, associated with contraction and atrophy of the muscles in the upper half of the limb attached to the external condyle of the humerus. The patient was a woman, æt. 80, and there was a history of slight injury. The hand was in good condition, though no pulsation could be felt in any of the vessels at the wrist, and the affection seemed to implicate the musculo-cutaneous nerve in its distribution to the skin and the musculo-spiral nerve in its distribution to the muscles and the radial as regards sensation. Mr. Greig expressed the opinion that the condition was primarily a nerve affection, and pointed out the incongruity of the distribution with a vascular derangement.—Professor Kynoch showed a specimen of carcinoma of the uterus removed by vaginal hysterectomy from an unmarried woman, æt. 56. The disease, which had been confirmed by microscopic examination, was confined to the endometrium. In contrast to this was a specimen of carcinoma in which the whole body of the uterus was involved except a small part at the fundus. A third uterus, which showed a condition of diffuse adenoma of the endometrium with a suspicious character on microscopic examination, had also been removed by vaginal hysterectomy. He also showed an ovarian cyst with torsion of the pedicle, which had produced symptoms calling for immediate operation in a young multipara fourteen days after a normal confinement. A fibroid removed from the anterior wall of the uterus after a previous operation by removal of the appendages, which had no effect in checking the excessive hemorrhage—the most prominent symptom—was also shown. The second operation was successful in giving relief.—Professor MacEwan read a paper on the "Treatment of Surgical Tuberculosis."

ANALYTICAL REPORTS.

Parke, Davis, & Co.'s Preparations.

Thyroidectin.—Recent attempts to discover a rational treatment of exophthalmic goitre have proceeded on the assumption that the symptoms of the disease are in the main those of hyperthyroidism, whence it follows that the tissue juices of animals deprived of their thyroids presumably contain substances capable of neutralising the excessive secretion of the thyroid in Graves' disease. Thyroidectin is such a preparation; it consists of the dried blood serum of thyroidectomised animals, and is put up in 5-gr. capsules. As yet the evidence of the therapeutic value of this and analogous preparations is contradictory. It seems, however, certain that in some cases striking benefit has followed their use, and as no ill consequences have so far been reported, the method deserves an extended trial. Messrs. Parke, Davis, & Co. are early in the field with thyroidectin; if we mistake not, they are the first among English manufacturers to put it on the market.

Acetozone.—We have received specimens of this germicide (benzoyl-acetyl-peroxide, or acetozone), which has now been in the hands of the medical profession for a considerable time. The fact that it is not poisonous admits of its extended use as an internal antiseptic, and it has been favourably reported on in typhoid fever, and various intestinal disorders attended by putrefaction. We have found it efficacious in checking vaginal discharges, while it has also been used successfully in treating ringworm and erysipelas. In fact, wherever a non-irritating antiseptic is required, acetozone will be found useful. It may also be used as a dusting powder in combination with zinc oxide, etc.

The same manufacturers also send out an *acetozone inhalant* consisting of 1 per cent. acetozone and $\frac{1}{2}$ per cent. chloretone in liquid paraffin. This preparation is quite unirritating, and when sprayed on the throat we have found it remarkably soothing in catarrhal affections associated with irritative cough.

Scopolamine-Morphine Tablets.—This combination of drugs has of late been recommended in many quarters as a preliminary to general anæsthesia. Less of the anæsthetic is required, and unpleasant after-effects are avoided. The tablets we have received are designed for subcutaneous injection, and contain $\frac{2}{3}$ gr. of morphine hydrochloride and $\frac{1}{64}$ gr. of scopolamine hydrobromide; it is directed that one-third part of a solution of one tablet be injected two and a half, one and a half, and half an hour before operation. It is, however, so customary to regard a single tablet as a single dose that we think it would be wiser to follow this rule, and reduce the amount of alkaloid in each tablet. If the whole of one were given at once, unpleasant results might follow, as $\frac{1}{64}$ gr. of scopolamine is a somewhat large dose.

Mentholated Throat Tablets.—From the same firm comes a modification of their mentholated throat tablets, the cocaine being omitted. Each modified tablet contains menthol, benzoic acid, oil of anise, and eucalyptol. These are useful sedatives in irritable conditions of the throat, and facilitate expectoration.

EDINBURGH
MEDICAL JOURNAL.

EDITORIAL.

The New Proprietors.

The *Edinburgh Medical Journal* in its hundred years of existence has passed through many changes, both in its ownership and amongst the occupants of its editorial chair. We trust, however, we are justified in saying that these changes, rendered inevitable by time and circumstances, have not impaired the life and vigour with which in 1805 it was launched as a medical periodical by Andrew Duncan, junior.

We have now to inform our readers of yet another transition, and one which we feel sure will be welcomed not only by all those friends who have given us so much loyal support and encouragement in the past, but also by all those who have held the historic association of the Journal in regard, and who desire to see the best traditions of medical literature maintained.

We refer to the purchase of the Journal by a representative body connected with the Edinburgh Medical School.

It will be remembered that when Messrs. Oliver & Boyd gave up the publication of the Journal it was purchased by Mr. Young J. Pentland, who for the last nine years has spared no effort to maintain its high reputation as a monthly periodical.

It was, however, felt by many who are closely identified with Edinburgh as a great medical centre, and who, moreover, take a certain pride in the traditions which cluster round the Journal, that it should if possible be owned by members of the profession. We have pleasure in stating that this end has been accomplished, and a body representative of every branch of Medicine will in future control its fortunes. The proprietors are:—G. A. BERRY, SIR HALLIDAY CROOM, D. J. CUNNINGHAM, G. H. MELVILLE DUNLOP, G. A. GIBSON, F. W. N. HAULTAIN, J. HUTCHESON, W. ALLAN JAMIESON, HARVEY LITTLEJOHN, P. M'BRIDE, ALEX. MILES, T. R. RONALDSON, RALPH STOCKMAN, ALEXIS THOMSON, A. LOGAN TURNER, DAVID WALLACE.

It affords us satisfaction to state that the business management will meanwhile remain in the hands of Mr. Pentland, who has consented to supervise and guide its commercial relations. This fact and the new vigour which its representative ownership foreshadows will, we trust, ensure for the *Edinburgh Medical Journal* a continuance of the success and prosperity which has been obtained in the past, and, let us add, a continuance of that kindly help and co-operation from its many friends which has so materially conduced to its reputation as a periodical.

Japan's Real Triumph. THE importance of commissariat arrangements in campaigns was tersely expressed by Napoleon, who said, "An army marches on its belly." The Russians in 1812 defeated Napoleon with the assistance of Generals January and February. Japan has conquered the Russians in the late war by defeating the silent foe of armies—disease. Surgeon-Major Seaman, U.S.A.,[1] graphically describes the paramount part the victory over disease played in the Russian defeat, and from data supplied to him by Japanese authorities, demonstrates the wonderful difference in the ratio of disease to wounds in the Japanese armies as compared with that of armies in all previous campaigns. Hitherto the mortality from bullet wounds has been 1 to 4 of those wounded, while the proportion of diseased to wounded has been at least 4 to 1. In the Russo-Japanese War the mortality from wounds was 50 per cent. of those wounded, but the number of diseased was only equal to and not greater than the number of wounded. In the Boer War the majority of the cases of disease were infectious. In the Japanese, infectious diseases constituted only 3·51 per cent. of the whole. Beri-beri, a disease wholly eradicated from the Navy, where it used to attack 25 per cent. of the total strength, accounted in the Army for 24·3 per cent. of the sick and wounded. These statements are almost incredible, but they are corroborated by documentary evidence in the possession of Major Seaman. That the killed should have equalled the wounded merely shows the severe nature of the fighting, but that the sick should not have exceeded the wounded is unique and most extraordinary, and deserves careful consideration by all nations. To what was it due? Three factors may have influenced it. First, the race; second, the climate and country; third, the preventive measures against disease adopted by the Japanese. Probably all three had an effect towards the result, and it may be that the third factor mentioned was the least powerful. It is generally admitted by foreign attachés and correspondents with the Japanese armies that the soldiers did their utmost to keep well—a form of patriotism which had been carefully inculcated for many years. Each soldier felt success in the war depended upon himself. With his military training the recruit is invariably imbued with the idea that his health is of prime importance. He is taught not only to respect but to implicitly obey the surgeon. His body is a fighting machine, which is the property of the Emperor. He is educated to believe that it is just as necessary to maintain his body in the best physical condition as to keep his rifle in a state of efficiency. To neglect either is unpatriotic, and constitutes an act of disloyalty to his Emperor. Such training would be of little good were those in authority indifferent to the provision of facilities for the soldier to carry it out, but the Japanese officers assist their soldiers. Along with scouting parties that go into new country, surgeons are sent, who examine water supplies and report upon their character. Each soldier is given a handbook which tells him how to guard against disease, and combatant officers are fully instructed how to care for their men. It is unnecessary to detail further the means used to prevent disease; it suffices to say that the surgeons have facilities given them to protect the soldiers against disease. The soldiers are educated to take advantage of these, and they do so. Notorious as the fighting courage of the Japanese soldier is, that Spartan fortitude which enables him in the battlefield, in spite of hunger and thirst, to obey the instructions of his officers in matters of health, is even more heroically admirable, and explains how the silent foe, disease, was defeated by the armies of Nippon. The non-irritating dietary of the Japanese is undoubtedly a factor in the prevention of alimentary troubles, dysentery and enteric, two of the chief infectious diseases to which armies are liable. The country and climate cannot have had a greater influence than in many other campaigns, as in equally good climates sickness has very frequently been rampant. The preventive measures which were adopted seem, therefore, to have been a most important factor, and if successful in a war where 600,000 men were at one time in the field, there is much need for careful searching of hearts amongst Occidental nations in whose campaigns the silent foe, disease, has been the chief enemy encountered. In the Boer War, the percentage of diseased to wounded was 8 to 1. In the Spanish-American War, the proportion was 14 to 1. "The Real Triumph of Japan" is dedicated to "the Medical and Sanitary Officers of the Japanese Army who have proved that the normal condition of the soldier is health, and that those who die in war should fall in the firing line, and not by the wayside from disease . . .; to that vast army of American dead, whose lives in war have been needlessly sacrificed through preventible diseases, ignorance, and incompetency; and to our Lawmakers, through whom the necessary reforms can come that will prevent the repetition of such sacrifice." The author says his statistics are accurate, and vouched for by General Oku, Major-General Mori, and others in authority, but we know how guarded the Japanese have been in divulging essential details, and perhaps the statistics eventually given by them may show a nearer approach to those of former campaigns. Such an authoritative account of the medical aspects of this great war must be eagerly looked for, but one feature in regard to the medical arrangements is very striking, the intimate and whole-hearted collaboration of the combatant and medical officers. Just as, in the Navy, the two sections work in unison, and in all matters of health and sanitation the medical officer is paramount, so in the Army the General Commanding defers to the opinion of the Surgeon-General where these subjects are concerned. How long will War Office red tapeism and stereotyped British methods permit the opposite to continue in our own army?

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[1] "The Real Triumph of Japan" (London, Sidney Appleton).

Post-Graduate Teaching in Edinburgh

It is with feelings of great satisfaction that we learn of a definite movement to reorganise Post-Graduate Medical teaching in Edinburgh. We have always held that instruction of this kind should form an essential part of the work of a large teaching school. It holds out a valuable inducement to old alumni to revisit their *Alma Mater*, and it makes it possible for the graduates of other universities to acquaint themselves with different methods of teaching. It is somewhat difficult in Edinburgh—where so large a number of undergraduates require instruction, absorbing not only so much of the time of the majority of the teachers, but making a very considerable demand upon its clinical resources—to arrange, at any rate in the meantime, for more than a short vacation course. A Committee, consisting of representatives from the Faculty of Medicine of the University, and from the Lecturers of the School of Medicine of the Royal Colleges, have had the whole question of Post-Graduate teaching under consideration. As a result of their deliberations, they have arranged for the holding of a short vacation course in the autumn, commencing on 17th September and concluding on 6th October. Whether the same period of the year will be selected for future courses will be determined after further consideration of the matter. A syllabus, containing all the necessary information, will shortly be issued.

In working out a scheme for a short course of Post-Graduate instruction, it seems to us that provision should be made for satisfying the requirements of two classes of men. There are those who desire to obtain a practical knowledge of the more recent advances made on the scientific side of Medicine and Surgery; there are others who are desirous of obtaining clinical instruction in special departments. As an illustration of the first, we may mention the large field which has been opened up by the cytological study of the blood and the cerebro-spinal fluid; the question of the clinical value of opsonins; the information to be derived from the chemical and microscopical examination of the gastric contents, and the more modern methods of investigating the functionating power of the kidneys. Provision has been made in the programme of the year for instruction in these different subjects. On the other hand, opportunity will be afforded to those desirous of improving their clinical knowledge by a study of such special subjects as Diseases of Children, of the Eye, Ear, and Throat, by demonstrations upon affections of the heart, lungs, and nervous system, while opportunities will be given for attending the Medical and Surgical departments of the Royal Infirmary.

A new feature will be introduced, which, we believe, will be generally appreciated. This will consist in the delivery of single lectures on special subjects, by gentlemen who are not otherwise engaged in the ordinary courses of Post-Graduate study. There will be at least six lectures of this description—two in each week—and they will deal with subjects of practical importance, and be given by those who are eminently qualified by experience to impart special information. An innovation will also be attempted, which, we feel, will greatly tend to the success of the meeting, and this is the endeavour to obtain one of the University halls as a place of residence. This, together with an effort which is to be made to add to the opportunities of social intercourse amongst teachers and students, should help to ensure a pleasant as well as a useful residence in our city.

The Teaching of Tropical Medicine in Edinburgh.

THE bestowal of the Diploma in Tropical Medicine and Hygiene for the first time at the Graduation Ceremony on Thursday the 12th of April marked a distinct advance in the teaching of this subject in Edinburgh, and the University authorities are to be congratulated on their ready appreciation of the importance of the subject and the success which has attended the institution of the diploma. It is, however, to be hoped that the present regulation, under which only graduates of the University can present themselves for examination for the diploma, may be reconsidered, as it tends to limit the number of candidates.

There are many reasons why the teaching of Tropical Medicine should receive special attention in Edinburgh. In addition to the general body of students, those who come from tropical countries to receive their medical education in the University or the Extra Mural School, and who annually qualify with a view to practising abroad either in the mission field, one or other of the public services, or as private practitioners, is very considerable. It is therefore absolutely essential that these students should be afforded opportunities of acquiring some knowledge of tropical diseases without being forced to the trouble and expense of proceeding elsewhere for the purpose.

This leads to the question, Is there sufficient clinical material in Edinburgh for the proper teaching of the subject? It is pleasing to be able to show that those who answer the question in the negative (the number includes many who should be better informed) are mistaken. If a review of the cases available for clinical instruction in Edinburgh during the last twelve months be compared with the reports of other schools in which the subject is taught, it will be found that, while in regard to the number of cases Edinburgh compares very favourably with these schools, in the variety of the cases treated it can fairly claim to more than hold its own.

Many of the cases are received from Leith, with which port, owing to the increased dock accommodation, there is a rapidly increasing trade from countries in the tropical and sub-tropical zone, while Glasgow and Dundee also furnish a fair number of patients. Besides, in spite of the time-worn joke, there is a constant stream of Scotsmen returning to their native land, many of them, unfortunately, suffering more or less from the effects of prolonged residence in tropical countries.

The period under review was marked by an outbreak of plague at Leith, and the arrival at that port of a vessel with a large proportion of her crew, chiefly Europeans, suffering from beri-beri. Two or more cases of each of the following diseases were likewise under treatment, namely: Malaria (acute and chronic), dysentery (one with abscess of the liver, which was successfully opened), sprue (one case fatal), bilharziosis, plague, beri-beri, Malta fever; while cases of filariasis, with chyluria, black water fever, calentura, and intestinal myiasis also occurred.

Arrangements have been made by which all students of tropical medicine will be afforded an opportunity of studying any cases of tropical disease which may be admitted to the Royal Infirmary; and if the number of cases continues to increase, it will perhaps, in the near future, be necessary to approach the Managers of the Infirmary with a view to obtaining the use of a small special ward for the reception of this class of patients.

A Great Medical Jurist.

THE fact that Dr. Brouardel has resigned his post as Professor of Medical Jurisprudence in the University of Paris will create a feeling of universal regret, although it is some consolation to hope that the leisure which he may now enjoy will restore his failing health and ward off for many years the inroads of advancing age upon his vigorous life.

Brouardel is one of that select band of great medical jurists which last century produced, and which included Taylor in our own country, Casper in Germany, and Hofmann in Austria.

Brouardel has written monographs in almost every department of forensic medicine, and there must be few who have read any of his works without being deeply impressed by their profundity of knowledge, as well as the delightful diction in which they are expressed. They recall in many ways Trousseau's celebrated Lectures, and we do not hesitate to say that, at any rate to medical jurists, they will remain as classical as the works of the great clinician.

Brouardel has probably been engaged in more *causes célèbres* than any man living, and not the least notorious of these was the celebrated "affaire Pranzini," or crime of the Rue Montaigne. Pranzini, it may be remembered, killed Marie Regnault, her maid, and her little girl. The case presented many points of great medico-legal interest. Marie Regnault had her throat cut, and the carotids were severed, but the vertebral column was intact. The maid's neck was also deeply cut, the vertebral column being opened behind, and the posterior columns of the spinal cord were divided. The child was found literally decapitated. The question of survivorship or priority of death arose, as the rights of inheritance depended upon its solution, and there are few more interesting chapters in medical jurisprudence than that in which Brouardel discusses this question.

It has been mainly owing to his initiative and energy that a great advance was recently made in the teaching of medical jurisprudence, by the institution of courses of practical instruction in the various branches, and of a special Diploma in connection with the subject.

In France and Germany it has long been recognised that the "nearest" medical man is not necessarily the best qualified to speak to the cause of death at a judicial investigation, and the step which Paris has taken to produce properly educated medical jurists is one which deserves the attention of those who are endeavouring to procure reforms in the antiquated system of coroners' inquests.

The Four-footed Gait in the Treatment of Scoliosis.

So far as we are aware, the ingenious system of exercises for the treatment of scoliosis devised by Dr. Rudolf Klapp of Bonn has not received that amount of attention in this country which it appears to deserve. Starting from the premise that none of the ordinary movements of human beings are calculated to correct the rotation—lateral curvature met with in scoliosis—he recommends the borrowing of four-footed movements from the lower animals. In the four-footed gait, every step forward of the hind leg is attended with a curving of the spine with the convexity to the opposite side, and with successive steps the spine is curved in opposite directions. In contrast to the erect posture, the four-footed attitude presents the advantages of taking the weight of the head and upper part of the trunk off the spine, of opening out the ribs on the concave side of the curve, of developing the spinal muscles with the minimum of fatigue, and of rendering mobile both ends of the spine. The details of the method will be described in the next number of the Journal, but we take this opportunity of directing the attention of our readers to what we believe is a great advance in the therapeutics of scoliosis.

The International Congress at Lisbon.

THERE was a time when an International Medical Congress fulfilled the expectations of those who took part in it. The Congresses held at Paris, London, Copenhagen, and Berlin were among the most successful gatherings of medical men the world has ever seen. The more recent attempts to hold a congress at Rome, Madrid, and Lisbon have not been crowned with success. The reports of representatives who have returned from the Portuguese capital tell the same story of incapacity on the part of those responsible for the management of the Congress. The preliminaries connected with the registration of members and the distribution of invitations were found on arrival to be in a state of chaos. The accommodation provided at the general meetings and receptions was so inadequate that many members failed to gain admission. The representatives of universities and colleges were passed over in favour of the Government delegates for the smallest states and principalities, who alone were invited to the Court functions. The arrangements for the sectional meetings and actual business of the Congress were so hopeless, that the reading of papers was to a large extent abandoned. The British visitors, who made the entire expedition in the *Ophir*, had a remarkably pleasant holiday, and were received with the greatest kindness by the British residents in Oporto. It has been decided that the next Congress will be held in Buda Pesth in 1909.

AT a meeting of the College held on the 15th May, Mr. James W. B. Hodsdon was elected the representative of the College on the General Medical Council in place of Sir Patrick Heron Watson, and Dr. R. Mackenzie Johnston was elected treasurer and secretary of the College in succession to Dr. Francis Cadell.

WE regret to have to record the death at Kinghorn on the 11th May of James Welsh, M.D. and F.R.C.S.Ed.; and at Edinburgh, on 25th May, of James Mowat, M.B., C.M.

AT a special meeting of the Medico-Chirurgical Society, held in the Royal College of Physicians on the 16th May, Dr. Walter G. Chase of Boston, U.S.A., gave a cinematograph demonstration of pathologic motion. The generalised convulsions of epilepsy were illustrated by a large number of photographic records, and there were also shown reproductions of the movements in Jacksonian epilepsy, athetosis, chorea, and nystagmus, and of the characteristic gait in locomotor ataxia, the various palsies of children, and other diseases of the nervous system. The demonstration was an unqualified success, and was greatly appreciated by a large audience.

THE 124th Festival of the Harveian Society was held on the 18th May in the Royal College of Physicians, when the president, Professor Sir Halliday Croom, delivered the Harveian Oration on "the Times of Harvey." The oration will appear in an early number of the Journal.

ORIGINAL COMMUNICATIONS.

THE PRACTICAL SIDE OF AN INFANTS' MILK DEPÔT.[1]

By W. Robertson, M.D., D.P.H., *Medical Officer of Health, Leith.*

I am pleased to be able to contribute to the discussions of this Society by bringing before it the subject of Municipal Milk Depôts. One usually reads pæans of praise regarding these admirable institutions. I do not intend to follow that precedent, but wish rather to place before you the weaknesses and shortcomings of these factors established for the reduction of a particular form of infantile mortality. I must, however, protect myself by stating that, despite my knowledge of these imperfections, I still believe in the value of the municipal milk depôt, and shall continue to repose my faith in it until something very much better is suggested and put into practical operation. Beginning at the crux of the whole subject of infant feeding by hand, one is compelled to turn one's attention (the vexed question, I should add) to the present-day milk traffic. Last winter Dr. Aitchison Robertson made out a very strong case against the milk supply of our cities. I do not intend to traverse the same ground so fully and clearly gone over by him. I desire rather to attack the problem in order to anticipate the argument advanced against the milk depôt principle. It has been said, and is still said, that a milk depôt is merely a clumsy cloak for an impure milk supply. In other words, that the only logical and practical step toward the end in view—to wit, the provision of wholesome food for infants—is to wait until the milk supply has been established upon an unimpeachable basis.

I can hardly imagine there is any one who will cavil at that ideal; but let us clearly understand what this standard of efficiency demands. My personal experience affords abundant testimony to show how enormous are the obstacles that confront us. In the first place, a pure milk supply ought to come from cows accustomed, for the greater part of the year at least, to chew the cud upon some meadow or rich pasture land. The cows, the milkers' hands, the dishes and pitchers, must also be scrupulously clean; and, to preserve the milk in all weathers, chilling ought to be resorted to. Now that is the ideal; an excellent ideal, to which we must aspire. Consider, however, the condition of affairs in Edinburgh and Leith. In neither district are the cows privileged to pasture, save perhaps in isolated suburban instances. The dairymen are in most cases utterly opposed to move out of the track trodden for years by their forefathers. They will provide good cowsheds and will make hurried attempts to keep their cows clean, but if they begin to find fault with their servants the latter will not only resent interference, but will without compunction leave the dairyman in the lurch. Time forbids their putting into operation what they are pleased to term fads of health officials. During the summer months they prefer to add formalin or boracic acid to milk rather than take time to pass the new milk over a chiller. The utmost vigilance is required to keep down adulteration by the addition of water, skimmed milk, and preservatives. And to complete the farce, glaring cases of adulteration—almost self-confessed adulteration—are taken before the Sheriff, who shelters himself behind an absurdly worded regulation issued by the Board of Agriculture, and dismisses cases without number. Indeed, so many rebuffs have been experienced in Edinburgh and Midlothian, that few cases are taken before the Court. In Leith we select our cases because we know that in only very glaring instances have we any hope of success. It is passing strange that in Glasgow the least aberration from the milk standard is met by a good fine. Obviously, then, in the East of Scotland adulteration is encouraged. It has developed into a fine art. Every dairyman in Midlothian will frankly tell you that it is easy to secure milk well above the standard, but, figuratively speaking, he winks his eye, since he knows exactly how much water he may add and yet be safe from detection or conviction. It is lamentable when one has to confess that it is necessary on the part of the official to watch some dairymen as a cat watches a mouse. Last year an outbreak of diphtheria was traced to a dairy in Leith at which several cows were discovered to be suffering from a teat eruption.[1] As soon as the connection between the dairy and the disease was established, the dairyman was asked to isolate his affected cows, and on no account to sell their milk for human consumption. This he faithfully promised to do. At the end of a week there was no cessation in the notifications, and as the milk supply was the same in each invaded house, I began to think a mistake had been made in assigning blame to the teats. Incredible as it may appear, inquiry elicited the fact, through one of my inspectors, that as "the doctor had been talking nonsense," the milk continued to be sold. To attempt to deal with such asinine propensities was pure waste of time. I accordingly stationed relays of inspectors at the cowshed at 5 A.M., 11 A.M., and 4 P.M. every day for a fortnight, it being their duty to insist that every drop of infected milk must be poured down the drains. The destruction of the infected milk checked the epidemic. The dairyman lost money; but to this day believes that I was in error. I shall pass over that experience. It is an instance, and a very striking instance, of what the official has to contend against, even when law and right are on his side, to protect the citizen.

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[1] A paper read before the Medico-Chirurgical Society of Edinburgh, 2nd May 1906.

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[1] *Public Health*, London, 1905, October.

One often hears it said, and I am in entire agreement with the remark, that cowsheds should not be found in towns. Let me clear away any doubts that may be in your minds when I inform you that we have no powers to remove already existing cowsheds from cities, unless the buildings are in a tumble-down condition, or are creating nuisance which is not remediable.

Another practical illustration will add force to that statement. Three years ago the War Office authorities communicated with me regarding a proposal to erect a large cowshed near the drill ground of Leith Fort. Sympathising with their effort, I tried to do what lay in my power to prevent what would undoubtedly develop into a nuisance; but I was met with the reply that I could not anticipate a nuisance. I could condemn the cowshed when it did actually become a nuisance. Such a proçedure, directed against a place costing nearly £2000 to build, would have branded an official as a fit subject for observation.

There is very little excuse for the dairyman. He has his technical journals, which tell him as plainly as they can tell any man, that to conduct a milk business with satisfaction to himself and his customers, he must be cleanly in every direction. The dairyman of the present day knows perfectly well how important it is to groom cows, and to have clean hands to milk the animals. He knows that cooled milk will keep sweet in the warmest weather; he also knows that up-to-date dairymen do sell milk in clean bottles.

What, then, does all this teach us? I submit that the lesson to be learned is, that as soon as the public is taught to insist upon chilled milk, delivered in bottles, the dairymen will pull up their sleeves and set to work to meet the demand. It is a mistaken idea that a fancifully planned and elaborately built cowshed is a necessary corollary to a pure milk supply. One naturally prefers to look upon a roomy and costly cowshed, but the most advanced dairyman in England at the present time boasts that, while his cows are housed in wooden sheds, he sells their product in as pure a condition as it is possible to collect it. The motive power is the intelligence of the dairyman himself. But beyond all that must be the momentum of public clamour, which will in time impel the sluggard to move with those of his fellow-men who have displayed enterprise and reap the benefit.

The medical officer of health can only adminster laws and make suggestions. It rests with the medical practitioner to teach his patients that what is best for them and their offspring is a milk supply collected under what I might term aseptic precautions. If, then, we are to obviate the necessity for milk depôts, we must do away with that necessity. I am perfectly convinced that a persistent clamour for pure milk on the part of the public will soon be practically answered. In Leith we have a case in point. I promised to support a dairyman if he would help me. Each of us has adhered to his bargain, and he has had no reason to regret the extra trouble he undertook to have clean hands, clean cows, and to filter and chill his milk, which is dispensed in bottles to a good many families.

Depend upon it, if the dairyman woke up one fine day to realise that his customers refused to be served from a pitcher, the lid of which had been removed over and over again in dusty thoroughfares and diverse places, we should soon discover a general tidying up all round amongst the milk-selling fraternity. I repeat again, as long as our citizens are pleased to take what is offered to them without demur, then so long must our infants labour under the deleterious influences of an unsatisfactory milk supply.

It is to counteract gross pollution, on the one hand, and ignorant methods of feeding, on the other, that the present-day milk depôt has been established. The long septic feeding-tube is done away with, methodical feeding is taught, and mothers in general are afforded an object lesson in correct principles of infant feeding.

Unfortunately, the comprehensive term "infantile mortality" has come to be most loosely applied in relation to the milk depôt. Many enthusiasts, without giving the subject the serious consideration which it deserves, have jumped to the conclusion that with the institution of a milk depôt there must come an immediate reduction in the infantile mortality of a district. A moment's reflection will show that measles and whooping-cough may be controlled by compulsory notification, and that the provision of prepared milk will not avert the deaths of infants from overlying, tuberculous meningitis, and other conditions that claim many victims before they reach the age of 1 year. But when investigations inform us that every year many infants are sacrificed at the altar of ignorance, we look for causes, and discover that gross neglect in feeding is the prime factor in bringing about so many diarrhœa deaths. Judicious breast-feeding I shall merely mention. Its importance cannot be overestimated. The present-day mother, be she rich or poor, surrounded as she is by the bewildering hum of gaiety and cheap amusement, seeks at the earliest moment to be relieved of a tie. The feeding-bottle is a ready refuge. The milk depôt has to come to the rescue. Incidentally I must mention that, as an accessory to the milk depôt, first place must be given to a lady health visitor. Popping out and in as she does at unexpected moments upon those whom she picks out as requiring observation, her work is of great value. It is educative, and it must be a very abstruse mind indeed that cannot grasp the fact that all the trouble taken by the "sanitary lady," as she is called, must be for the good of the child being jealously observed. Not a few infants have been snatched from the inevitable result of ignorant guidance by the persistent efforts of our tactful and kindly lady inspector, Miss Armour.

To come to the depôt itself, let me briefly outline its methods. In the first place, the milk supply was a difficult question. Two summers ago an estimation of six samples of milk, taken from six dairies, demonstrated the fact that the bacterial pollution varied in them between 20,000 to 250,000 per c.c. To prove what could be done by drawing milk from clean teats with clean hands into a sterile bottle, the bacterial contamination was shown to be only 700 per c.c. Generally speaking, one has to be content with an impurity of at least 12,000 bacteria in a c.c. That, in fact, is looked upon as a standard supply of clean milk. My choice finally rested upon a dairy farm in Haddington, where the cows were for the greater part of the year fed upon natural pasture, and where every precaution was adopted to ensure a clean supply. I have had no reason to regret my choice; the bacterial examination revealing 15,000 bacteria per c.c. After the milk reaches the depôt, water, cream, and sugar are added, the proportions of cream and water added varying according to the ages of the children to be fed. It has required much experimenting to arrive at a fairly uniform mixture. The proteids were usually in excess, and the fat low. As a rule, the fat varies between 3 per cent. and 3·4 per cent. After the bottles have been filled with their proper quantities, they are placed in the steriliser, and subjected to the influence of steam at a temperature of 180° F. for twenty minutes. Subsequent to this, to complete the process of Pasteurisation, the bottles are placed in a tank containing cold water. When the depôt was first opened, and during the first year and a half of its operations, an attempt was made to sterilise the milk. I use the word "attempt" intentionally, as the context will presently show. The milk was subjected to a temperature of 212° F. for half an hour, a preliminary half-hour being necessary to reach that degree of heat. This procedure was unsatisfactory, first, because the prolonged heating frequently caramelised the milk; secondly, because the milk was not sterile; and thirdly, because two cases of scurvy were brought to my knowledge, both infants having been exclusively fed upon the prepared milk. Dr. Burn Murdoch had one of these cases under treatment at the Sick Children's Hospital, Dr. Murray Wood of Leith the other. These two cases, occurring though they did at widely separated intervals, seriously affected the depôt, and some time elapsed ere we recovered credit in the eyes of prospective and actual users of the milk. But I must ask you to suspend judgment regarding the evil influence of cooked milk, since at the first note of alarm a careful analysis revealed a lamentable deficiency in fat. This defect was immediately remedied. Pasteurisation and the addition of fat have not been followed by any suggestions of scurvy. It is very significant that some months before the occurrence of our first case, Dr. Ashby[1] had reported a case of scurvy in a child fed upon milk prepared at the depôt from which I had secured my original recipe.

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[1] *Brit. Med. Journ.*, London.

Another point of very great interest centres round the question of sterility, as applied to milk prepared at a municipal depôt. My assistant, Dr. Mair, undertook an exhaustive bacteriological examination of 100 bottles of milk believed to be sterile. Dr. Mair and I detailed our findings in a paper.[1] His examination was conducted between the months of November and January, at a time when the proliferation of micro-organisms in milk is inhibited by the prevailing temperature. Only 15 per cent. of the bottles were found to contain sterile milk. I am again glad to be able to record my high appreciation of Dr. Mair's work. His results, like many side-issues in science, have little heed paid to them, though their importance cannot be overestimated when, as in this instance, their teaching is practically applied. Professor Flügge of Breslau, Weber, and Lubbert had already worked on these lines, and their results afforded us very valuable assistance. Their conclusions were that such a thing as really sterile milk was extremely difficult to secure. With that knowledge in his mind, Flügge suggested that all so-called sterilised milk should be termed "heated milk, not sterile" (*Erhitzte Milch, nicht Keimfrei*). A brief review of the bacteriology of milk will indicate wherein lies the difficulty to secure its sterility.

Roughly speaking, there are three groups of organisms found in cows' milk.

First, those belonging to the *Coli*, *Proteus*, and lactic acid group. These are normal inhabitants of the mammary ducts of the cow, and can easily be killed by short exposures to heat.

Secondly, the butyric acid bacilli, anaerobic, spore-bearing organisms, capable of rapidly decomposing milk with coagulation and gas formation. Their spores can be killed after exposures of an hour to an hour and a half at 212° F. It is interesting to know that Klein's *Bacillus enteritidis sporogenes* belongs to this group.

Thirdly, there is the *Subtilis* group, which Flügge has named the peptonising organisms, since they are capable of decomposing milk with faintly acid or unchanged reaction. It is to these organisms, in fact, that he has called serious attention as being the prime factors in the causation of summer diarrhœa. So resistant are the spores, that exposures for two hours at boiling temperature are necessary to kill them.

The point of practical importance to the physician is that these very resistant organisms can exert their evil influence on milk without altering its taste. Another point of moment is that these organisms do multiply in milk maintained at such high temperatures as 80° F. From this it will be realised how unsafe to the infant it is to store its milk in rooms indicating temperatures of 70° F. or upwards. Such temperatures during summer and autumn do, in point of fact, exist in many houses and kitchens.

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[1] *Brit. Med. Journ.*, London, 1904, May 14.

I still am at a loss to account for the cause of the scurvy in the two cases mentioned. Toxicity of the milk was a possible factor, taking into consideration the fact that our sterilisation merely invited the development of micro-organisms capable of giving off toxins. Over-cooking was a possible cause, and, lastly, so was fat deficiency. Dr. Still had something very trite to say on this aspect of deficiency of fat, or mal-assimilation of it by the infant in relation to scurvy. I refer to his article.[1] The great advantage of Pasteurisation is that it scarcely alters the taste of the treated milk. I have shown that so-called sterilisation is incapable of destroying the peptonising spores. When we prolong the application of a boiling heat to milk, it is caramelised.

Experience teaches us that Pasteurised milk carries with it the disadvantage that the cooking, be it only partial, throws the onus of digestion upon the intestines. But if sterilisation, as it has come to be applied to milk, is a wrong procedure, Pasteurisation errs on the safe side by inflicting as little damage as possible on the milk. The authorities in the city of Rochester experienced the difficulties of sterilisation and resorted to Pasteurisation; but they have advanced a stage further, and now supply milk collected at the farm, the milk bottles being immediately packed in ice to restrain bacterial growth. Forty-three daily samples of milk so prepared were analysed, and found to contain an average of 14,000 bacteria per c.c. During the same period, milk, as retailed in the city milk-shops, yielded an average of 235,000 bacteria per c.c. The valuable feature of the Rochester system is that the milk is bottled almost as soon as it leaves the cows. It passes through no middleman's hands, nor is it buffeted about stations, carts, and stuffy railway waggons. The milk is not prepared for infants at Rochester. To my mind, its great advantage is that its delivery in bottles enables the purchaser to secure very pure milk which, by the exercise of a very little care, can be kept pure by immersing the bottles in a dish of cold water.

This system of providing pure milk is the ideal upon which we must devotedly concentrate our energy and attention.

A serious defect of the British Infants' Milk Depôt is that supervision of the children fed upon the milk is very perfunctory. In Leith and in other municipalities where the system is in operation, lady health visitors periodically visit houses where infants are being fed on the milk. In Glasgow, a lady practitioner has been appointed to devote her undivided attention to this work; but even that step is insufficient when we take into consideration that between 200 and 300 babies are being daily fed on prepared milk in that city. Nothing can equal the system followed in

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[1] *Practitioner*, London, 1905, October.

France, where infants are brought to a dispensary to be examined, weighed, and their parents advised as to future management. Weighing is of great moment and value, yet, in this country, mothers absolutely refuse to have their children put in the scales. It is believed to bring bad luck. Pasteurised milk does not agree with all infants. We attempt to make that clear to parents, but, unfortunately, they lose sight of our hints, and when, as occasionally happens, a child being fed upon the milk fails to progress as the mother would like to see it grow, a regular tirade is preached at the depôt milk. The fiery cross goes forth, and from within the radius reached by the aggrieved mother's tongue no infants come to the depôt. Bottles are frequently found by the lady inspector inside ovens in which the milk is being prepared for the next meal. One cannot be surprised, therefore, when an indignant mother comes to us with a curdled feed, forgetting in her ignorance that she wilfully invited coagulation and gas formation by the use of her domestic incubator. For young infants each meal is so small that our system is decidedly unpopular. The meagre quantities are viewed with headshakings. The popular quantities are those found in bottles prepared for babies of two months of age and upwards. Over and over again we detect mothers supplementing the food provided in the bottles.

The vast majority of infants brought to the milk depôt are put on the prepared milk because every other form of feeding has been tried without success. And though it can be said that Pasteurised milk disagrees with some infants, we can with confidence assert that cows' milk, as mixed in the home, is the prime factor in compelling mothers to seek relief afforded by Pasteurised milk. As I have said, it may throw the onus of digestion upon the intestines, but many an infant with pinched cheeks, sunken eyes, and wasted frame has been brought back to life and vigour by the timely prescription by the physician of Pasteurised milk. All this means that the depôt is called upon to pass a severe ordeal. It has come to be looked upon, too often, as a last resort. That it does come out of the ordeal with credit says much for the principle of preparing milk in suitable quantities and in definite proportions.

As an educational factor, the Leith Depôt has been of immense value. The sale of feeding-bottles with long rubber attachments has markedly declined. Many now Pasteurise their milk at home. Those who follow the rules and suggestions given at the depôt have nothing but praise for the system.

It must be confessed that we do not always reach the infants who really stand in need of our depôt milk. When one comes to deal with facts, there is no need to beat about the bush. The real truth is that the parents of many slum children pay most attention to the public-house bottle. Infants are allowed to battle for existence upon anything that costs little. To study the life-history of an unfortunate slum infant is to appreciate the philosophy underlying the survival of the fittest. The parents of these children will not take the trouble to come or even send for the milk, but they will cheerfully go to the other end of the town if they learn that whisky is on tap in a friend's house. I hold these people in very poor esteem indeed, and I am strongly impressed with the need for legislation that will enable us to tax careless and dissolute parents, such tax taking the form of a weekly contribution towards the proper feeding of children.

In conclusion, I can say with confidence that our depôt has done a vast amount of good. It has saved not a few lives, and has taught many parents how their infants can be rationally reared on the bottle. Among the infants fed upon the depôt milk in 1904 there were no diarrhœa deaths; among the other infants born but hand-fed there were thirty-six deaths. In 1905, three infants fed upon the depôt milk died as the result of diarrhœa; of the infants born and not fed on the milk forty-nine died as the result of diarrhœa —in every case these latter were hand-fed babies. It is necessary in the interest of the depôt to explain that the water famine in the summer of 1905 affected the farm from which our milk supply was drawn. The consequence of this was that our milk was not chilled before leaving the farm, and bacterial prolification was permitted to have full sway; our treatment of the milk at the depôt being powerless to kill those very resistant spores which were the means of sowing the seeds of diarrhœa.

GREEN, BLUE, MAGENTA, AND OTHER COLOURED URINES.

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(Plates XIV. and XV.)

Some months ago our attention was called to a specimen of bright magenta urine, passed by a patient suffering from aphasia due to hæmorrhage into the third left frontal convolution. He had in addition cystitis, and the urine was strongly alkaline. We were told that the colour was due to blood, and that it gave a characteristic spectrum. As the urine contained only a small quantity of albumin, we were disinclined to accept this statement, and it seemed to us that the colour must be due to the action of some drug. We were told that the patient was taking nothing but a mixture of iodide and bromide of potassium, but this was not sufficient to account for the unusual appearance. A few days later it transpired that the patient had been given every night a dose of the synthetical purgative known as "purgen." This afforded an ample explanation, and a chemical and spectroscopical examination proved without doubt that the colour was due to phenol-phthalein.

About the same time we were sent, for examination and report, by one of our colleagues, a specimen of pea-green urine. We had no history of the case, and were at first inclined to think that the colour was due to indigo, but investigation served to convince us that it was a methylene-blue urine, but why the drug was taken or under what circumstances we do not know.

These cases excited our interest in the subject, and little by little we have accumulated specimens of urines of all colours—blue, green, purple, orange, and black. We have examined more than a hundred, chemically and spectroscopically, and have arrived at certain conclusions, which are embodied in this paper.

The literature of the subject is more extensive than might be supposed, but we append few references, as the ground has been so thoroughly covered by the admirable article of Dr. Ralph Stockman which appeared in the *Edinburgh Medical Journal* of August 1902.

1. Blue and Green Urines.—The great majority of blue urines are methylene-blue urines. Methylene-blue is tetramethyl-thionine hydrochlorate. In doses of from 1 to 3 grs. three times a day it is given in cases of chronic nephritis, cystitis, and gonorrhœa, and also in the treatment of patients suffering from bilharzia hæmatobia. It has antiseptic properties, and is said to be useful in the elimination of uric acid. A quarter of a grain twice a day imparts a pea-green colour to the urine, whilst the same dose more frequently repeated turns it a peacock-blue. These urines keep well, undergoing decomposition slowly. After a time, under the influence of bacterial action, they lose their colour, which, however, is speedily restored on shaking, owing to the absorption of oxygen. The addition of a few drops of formic-aldehyde to a methylene-blue urine will prevent decolorisation almost indefinitely. Not uncommonly there is a deposit of urates which retains a blue colour after the fluid itself shows no indication of either a green or blue tint. A blue urine which had kept well for weeks became turbid and lost its colour. A fortnight later it was filtered, and the mere act of filtration at once restored its colour. Two months later, when every trace of the blue had disappeared, withdrawing the cork and shaking vigorously for a few minutes produced at first an olive-green colour, then a sage-green, and finally a well-marked blue. Sometimes the restored blue tint is confined to the upper layer of fluid, gradually merging

below into the amber of normal urine. This is the explanation of the multi-coloured urines sometimes seen. A deep blue urine mixed with tincture of iodine is either decolorised or assumes an olive-green tint. We find that the blue and green colours produced, as above indicated, are not discharged or altered by exposure to X-rays for ten minutes, nor by the action of a powerful Finsen light in thirty minutes.

The majority of patients who pass these green and blue urines are not aware that they have taken any drug. In some cases the methylene-blue has been administered surreptitiously as a practical joke, and pink-coated sweets are sold for this very purpose. In other cases the methylene-blue has been introduced into confectionery as a colouring agent; this, however, is probably not very common, for in the "Report of the Departmental Committee on the use of Preservatives and Colouring Matters in Foods (1900)," no reference is made to it. A largely advertised remedy for kidney troubles contains this ingredient. Nine-tenths of the blue and green urines submitted for examination are due to the action of this drug. Green urines may be due to biliverdin, easily recognised by its characteristic tests, but they are not common. There is no possibility of confounding methylene-blue urine with carboluria.

The chemical tests for methylene-blue urines are fairly characteristic. The colour is said to be extracted by chloroform, but this in our experience is hardly the case, for this reagent only partly extracts the colour. It is said, too, that on heating with hydrochloric acid the blue colour disappears, and on shaking vigorously in the presence of air reappears, either in the original blue form or in a green. We are unable to confirm the statement, and find that hydrochloric acid has no effect visibly, even on heating. We are also unable to confirm the statement that on heating with nitric acid the colour remains unaltered, for it turns blue urine green. The action of bacteria is perhaps the simplest test, although it has no differential value. It is said that if the colour disappears in a few hours and is restored on shaking, methylene-blue is present, and that in the case of indigo-blue the action takes place much more slowly, in other words, that indigo-blue is more stable. We do not find that this is the case, and are satisfied that the comparative rapidity is not of much use as a test. There are other and better tests for methylene-blue in urine. The best chemical tests are—

1. Caustic potash or soda solution produces a violet colour.

2. Nascent hydrogen and other reducing agents decolorise it, the blue reappearing after a short time in contact with the air.

3. Peroxide of hydrogen added to the urine which has lost its colour at once restores the blue. To a specimen of methylene-blue which had been kept in a bottle for many weeks and had lost

every trace of colour, a few drops of peroxide of hydrogen were added and immediately the blue was restored.

4. A dilute solution of permanganate of potassium with sulphuric acid acts in a similar manner. Bleaching powder has the same action.

These tests are reliable, but the most characteristic test is afforded by the spectroscope.

Methylene-blue in dilute aqueous solutions gives a narrow dark band in the red and orange. In strong solutions, the whole of the red and orange and the yellow end of the spectrum, together with part of the green, is cut off, the remainder of the spectrum being visible. In urines containing methylene-blue these effects are always seen, but in addition the violet and indigo are darkened when the original urine possessed a marked yellow tinge, the darkening of this end of the spectrum being due to the yellow colouring matter of the urine.

We have studied in some detail the absorption spectra of methylene-blue urines, and in order to make the investigation as complete as possible, we noted the absorption spectra of—(1) Methylene-blue in aqueous solutions of varying strength; (2) various methylene-blue urines obtained from many patients; (3) normal urines from different sources. The results obtained are shown in lines 2–14 (Table of Spectra, Plate XIV.), and the limits of the bands observed are given in wave-lengths (λ) and on the scale adopted by us. (*See* Table 1.)

Spectrum 6 (aqueous solution of methylene-blue 1 in 100,000) is the only one which shows two distinct bands, and it is evident that the urines examined did not contain more than 1 part of this colouring matter in 200,000, and usually a smaller proportion.

A striking similarity is seen in spectra 7 and 10, 9 and 11, 8 and 12, and 9 and 14 as regards the width of the band in red and orange; a very slight shifting of the position is doubtless due to some of the constituents of the urine, in the urine spectra 10–14. The absorption in the violet end in the spectra 10–12 is clearly due to the yellow pigment in the urine, and is practically identical with the absorption in normal urine (spectra 2–4).

The green-coloured methylene-blue urines show a greater absorption in the violet end, suggesting that the green colour is probably due to the greater predominance of the yellow pigment in the urine. In spectrum 14, where the urinary pigment is practically absent, the restored methylene-blue colour was a light blue, not green.

From these observations it is possible to account for the mystery of the green colour in urine containing methylene-blue, the explanation being that the colour is illusory; the methylene-blue is still there, but appears green owing to dilution and admixture of the yellow colour of the urine. This was confirmed by observing the behaviour of a urine originally containing methylene-blue, which after six weeks had not only lost the blue tint but the yellow tint also, and was quite devoid of colour. Both on shaking with air and on adding hydrogen peroxide or bleaching powder solution, a blue, not a green, tint at once appeared.

Table 1.—*Showing Size and Limit of Dark Bands in Absorption Spectra of Normal Urines, Aqueous Solution of Methylene-Blue and Indigo, and in Methylene-Blue Urines.*

No. of Spectrum.	Dark Bands λ.	= on Scale.	Absorption in Violet end of Spectrum λ.	= on Scale.	
1	...	...	...	...	Solar spectrum.
2	...	...	437 to end	137 to end	Normal urine— 8 months old.
3	...	...	438 ,,	135 ,,	1 day old from separate sources.
4	...	...	438 ,,	135 ,,	,, ,,
5	684–592	24–49	...	...	Methylene-blue aq. sol.— 1 in 50,000.
6	680–640	25–35	...	...	1 in 100,000.
7	680–640	25–35	...	...	1 in 200,000.
8	677–650	26–33	...	...	1 in 400,000.
9	670–650	27–33	...	...	1 in 800,000.
10	690–657	23–31	443 to end	130 to end	Methylene-blue urine— olive-green.
11	690–663	23–29	467 ,,	110 ,,	blue-green when examined, originally deep indigo-blue.
12	701–656	21–31	433 ,,	140 ,,	opaque blue.
13	696–668	22–28	475 ,,	105 ,,	green when examined, originally blue.
14	677–652	26–33	433 ,,	140 ,,	colourless, becoming light blue on oxidation.
15	651–606	32–45	...	...	Indigo aq. sol.— 1 in 20,000.

Methylene-blue is partly excreted with the fæces, which present a bluish tint.

When injected subcutaneously it is excreted with the urine. In a case under our observation, 17 minims of a 5 per cent. solution of methylene-blue were injected into the gluteal region, and in thirty-five minutes the urine had a greenish tint, whilst in sixty-five minutes it was distinctly blue. The patient continued to pass blue urine for forty-eight hours, after which the colour gradually disappeared. This test has been found useful in the case of patients suffering from various forms of renal disease, and one of us has employed it frequently.

It is not improbable that some of the cases of blue human milk which have been recorded may be explained in the same way, but we have had no opportunity of investigating the point.

Methylene-blue is in mice an antidote for trypanosomiasis or sleeping sickness, and we recently saw at the Institut Pasteur some white mice with bright blue eyes and blue tails. This was due not to cyanosis but to the action of the drug. Our colleague Dr. Blaxall has been kind enough to furnish us with some urine from mice treated in this manner. It was of a bright blue colour, and gave the usual tests and spectra. We know by report of cases of epilepsy treated with large doses of methylene-blue; in some of the patients the ears, nose, and nails assumed a blue colour, which, however, speedily disappeared on discontinuing the treatment.

Although the great majority of green and blue urines are due to methylene-blue, they must sometimes be produced by other causes, for cases of blue and green urine were recorded before the discovery of aniline dyes, and the presence of indigo has been suggested as an explanation. Very large quantities of indigo may be taken without affecting the colour of the urine. The indigo found in the urine is formed from indoxyl sulphate, a derivative of indol, a product of intestinal digestion. Indican or potassium indoxyl sulphate is present in normal urine, and more abundantly in cases of obstruction of the small intestine and other diseases in which there is increase in the putrefaction of proteids. It may also occur after the administration of certain drugs, such as creosote, benzoin, aldehyde, or turpentine. It readily splits up on oxidation into indigo-blue and potassium hydrogen sulphate. The indican of urine (sometimes called animal indican) was so named from an erroneous idea that it was identical with vegetable indican; this last is a glucoside, and resembles animal indican only in the fact that indigo-blue is one of its products of decomposition when boiled with acids.

Indigo-blue urines are always alkaline in reaction, and are usually in a state of decomposition. The colour, as in the case of the methylene-blue urines, is discharged after a time by the action of bacteria, and the colour reappears on shaking with air. With nitric acid, indigo-blue is split up into isatin, and the colour cannot be restored by shaking. Sometimes, however, with this reagent a reddish-brown or ruby-coloured solution results, due to the oxidation of the indigogens normally present in the urine. The colour of the indigo solution is not altered by exposure either to X-rays or the Finsen light.

The spectrum of indigo is characteristic, and shows an absorption band in the orange (see spectrum 15, Plate XIV.).

We can only repeat that indigo-blue urines are rare, and that the common cause of blue urines is the ingestion of methylene-blue. It is curious that the fact is not more generally recognised and accepted. Some time ago a case of blue urine was published in one of the medical papers. It was known that the patient had taken methylene-blue, and the urine gave the characteristic chemical tests for this substance; but the author, ignoring this obvious fact, maintained that the appearance was due to duodenal indigestion. Trypsin, he argued, in the small intestine breaks up proteids into peptone, peptone into leucin and tyrosin, and further into indol, phenol, and other bodies; indol by the putrefactive action of *Bacillus coli* in the intestines forms indican, *i.e.* potassium indoxyl sulphate. This may be perfectly true, but it is absurd to have recourse to so complicated a theory when the obvious explanation is at hand.

2. Black Urines.—(1) *Carboluria.*—Carbolic acid urine, when voided, is either dark in colour or becomes dark on exposure to air from the formation of hydro-quinone, an oxidation product of phenol. Carbolic acid urines usually have an olive-green colour, but may be smoky. The carbolic acid may be detected by distillation after the addition of sulphuric acid; the distillate gives a purple colour with ferric chloride, and a white precipitate of tri-bromo-phenol with bromine water. A patient suffering from an obstinate attack of subacute articular rheumatism was given 30 grs. of salicylic acid every three hours for twenty-four hours, making a total of 240 grs. She suffered from the ordinary symptoms of salicylic acid intoxication, and passed dark-coloured urine. Smoky urines, however, are more commonly due to the admixture of small quantities of blood. Fuchsine in small doses, half to one grain three times a day, may produce an olive-green urine.

(2) *Melanuria.*—A *café-au-lait* urine is sometimes passed by patients suffering from melaniasis, especially when there is melanotic sarcoma. Melanotic tumours originate in tissues, the cells of which normally contain pigment, for example, the choroid coat of the eye. Melanuria may occur in malarial cachexia and in melanotic affections of the skin and liver, but is not always present. It may occur, too, after the ingestion of certain drugs, such as creosote and turpentine. On the addition of nitric acid it becomes black from the conversion of the chromogen of melanin into melanin. Melanin is a sulphur pigment, and contains no iron; it has no characteristic spectrum, is soluble in alcohol, ether, mineral acids, and caustic potash, and is bleached by chlorine. When a strong solution of ferric chloride is added to melanuric urine, there is a greyish-brown precipitate of phosphates and pigment, soluble in excess of ferric chloride. We have worked carefully over the urines of a patient suffering from melano-sarcoma involving the adrenals, and of another with a melano-sarcomatous growth of the face, but have failed to discover melanin. In a case of melano-sarcoma recently seen in the

clinique of Professor Gaucher at the Hôpital Saint Louis in Paris, melanin could not be detected either in the urine or in the blood.

(3) *Hæmoglobinuria and hæmatoporphyrinuria* are both characterised by a port-wine colour. Hæmatoporphyrin is iron-free hæmatin or hæmatoidin, and is frequently found in the brain and spleen and other organs after the partial absorption of effusions of blood. It appears in the urine after any unusual disintegration of blood corpuscles by which an excess of hæmoglobin is set free. Hæmatoporphyrinuria is a common symptom of sulphonal and trional poisoning, and is always of grave import. It is possibly due in these cases to the gradual absorption of altered blood from the hæmorrhages in the mucous membrane of the stomach and intestines produced by these drugs. The reason why hæmatoporphyrin is produced and not hæmoglobin may be explained on the supposition that hæmolysis takes place more slowly than in those conditions attended with paroxysmal hæmoglobinuria. Against the theory that in sulphonal poisoning the condition of the urine is due to the absorption of altered blood, it is urged that there is no corresponding increase in the excretion of iron, and no diminution in the number of erythrocytes or of the percentage of hæmoglobin. We are not sure, however, that such is the case.

Personally we have had but little experience of hæmatoglobinuria, and we have consequently availed ourselves freely of the researches of our colleague Dr. S. Monckton Copeman, who was one of the first, if not the first, to point out the existence of this condition. In an admirable paper, Copeman[1] describes three specimens of port-wine urine, probably due to chronic sulphonal poisoning, although this is not distinctly stated.

There are several chemical tests which serve to distinguish hæmatoporphyrin in the urine from free hæmoglobin. Probably the most reliable of those is the guaiacum test. Guaiacum affords a characteristic and reliable colour reaction for hæmoglobin and methæmoglobin, but gives no blue colorisation with hæmatoporphyrin.

The chief dependence, however, must be placed on spectroscopic examination combined with the simultaneous use of various chemical reagents. Dr. Copeman, working with Dr. MacMunn, found that the port-wine fluid gave a four or five banded absorption spectrum with the chemical spectroscope, practically unchanged by ammonia or sulphide of ammonium, whilst the addition of dilute sulphuric acid changed it to the spectrum of acid hæmatoporphyrin. Wave-length measurements of the absorption bands are given in his paper.

3. RED AND PURPLE URINES.—For the purposes of this article, ordinary febrile urine loaded with lithates, and urine containing

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[1] *Trans. Path. Soc. London*, 1891, vol. xlii.

blood in large quantities, may be excluded. There are, however, other urines which present a red colour from the action of drugs.

(1) "*Purgen*" *urines.*—The synthetical purgative employed under this name is dihydroxy-phthalo-phenone, familiarly known as phenol-phthalein. It belongs to the class of bodies known as phthaleins, derivatives of triphenol-methane. It is not a dye, but is related to certain well-known dyes, such as eosin and fluorescin The history of its introduction as a therapeutical agent is well known. From its well-marked chemical reactions it was used to earmark certain wines. Consumers were not slow to point out that, although it might be somewhat wanting as a beverage, no objection could be urged against it as a purgative. The dose for an adult is usually said to be 7½ grs., but we usually give it in doses of from 15 to 20 grs. If administered in these doses in the morning early, it acts promptly, in from two to three hours. It induces copious watery motions, unattended with pain or griping. In a case of obstinate constipation in a girl, æt. 19, we gave it in 15-gr. doses every alternate hour for twelve hours, without the production of any inconvenient symptoms. When the urine is acid there is no coloration; when the urine is alkaline or neutral it shows a deep crimson-red colour. The colour is destroyed by acids and restored by alkalies. The spectrum of urine coloured with "purgen" is identical with that of a solution of phenol-phthalein, that is, in strong solution the whole of the spectrum, with the exception of the red and orange, is either very much darkened or completely blotted out, whilst in more dilute solutions a distinct band is seen mainly in the green.

We have made many experiments with "purgen," and the Table 2 of spectra 16–22 shows its identity with phenol-phthalein. The characteristic band in urine containing it by which it may be detected coincides with the band produced by corresponding strengths of purgen and phenol-phthalein.

The above figures and a comparison of spectra 16–22, to which they apply, strikingly demonstrate the identity of purgen with phenol-phthalein, and suggest even a method of its quantitative estimation in minute quantities by spectroscopic examination.

Spectrum 22 shows the absorption spectrum of urine containing purgen, and its identity with Nos. 21 and 18 needs no further elucidation.

Pyoktanin and fuchsine, the spectra of which are shown in Nos. 23–26, are dealt with later.

The question as to whether purgen is excreted by the urine as such, or in the form of some closely allied derivative, is discussed in Tunnicliffe's paper,[1] but from our experiments there is no doubt that it is secreted as such. When potash or ammonia is added to the motions after pheno-phthalein has been taken, the whole mass develops a brilliant purple colour, an indication that much of it is eliminated with the fæces.

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[1] "Synthetical Purgatives," *Brit. Med. Journ.*, London, 1902, October 18.

TABLE 2.—*Showing Size and Limit of Dark Bands in Absorption Spectra of Alkaline Aqueous Solutions of Phenol-phthalein, Purgen, of Urine containing Purgen, and of Aqueous Solutions of Pyoktanin and Fuchsine.*

Spectrum.	Dark Band λ.	= on Scale.	
16	571–537	56–70	Phenol-phthalein alkaline aqueous solution—1 in 40,000.
17	569–549	57–65	1 in 80,000.
18	571–544	56–67	1 in 100,000.
19	569–537	57–70	Purgen alkaline aqueous solution—617 grms. in 1600 c.c.
20	563–544	59–67	$\frac{1}{2}$ strength of No. 19.
21	577–544	56–67	$\frac{1}{4}$,, ,, 19.
22	575–549	55–65	Purgen urine alkaline reaction, marked red tinge.
23	624–507	40–85	Pyoktanin aqueous solution—1 in 40,000.
24	615–582	42–53	,, ,, ,, 1 in 80,000.
25	575–467	55–110	Fuchsine aqueous solution—1 in 10,000.
26	572–540	56–69	,, ,, ,, 1 in 20,000.

The substance sold as "laxoin" is apparently phenol-phthalein, and gives the same reaction with the urine.

(2) "*Purgatin*" *urines.*—Purgatin is chemically anthrapurpurin diacetate. Its purgative properties, absorbability, and toxic action in large doses have been fully discussed by Dr. Marshall, Professor of Materia Medica in the University of St. Andrews, in his paper.[1] The dose as a purgative is, we find, from 20 to 25 grs., smaller doses being uncertain in their effect. It colours the urine a bright red both in acid and in alkaline solutions.

Purgatin does not lend itself to easy identification by means of spectroscopic observation. In concentrated solutions, part of the orange, yellow, and green are cut off, but on dilution no characteristic band is seen, hence in urine we have not yet been able to identify its presence by this method with any certainty.

(3) *Pyoktanin urines.*—Pyoktanin or methyl-violet is penta- and hexa-methyl pararosaline hydrochlorate, and is said to be an efficient germicide. It has been used in gonorrhœa, cystitis, and some forms of Bright's disease. It shows a well-marked band in the orange and yellow and part of the green (see spectra 23 and 24).

Chemically, pyoktanin may be detected by the following reactions: On addition of hydrochloric acid to the aqueous solution, the colour turns first blue, then green, then deep yellowish-brown,

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[1] *Scot. Med. and Surg. Journ.*, 1902, May.

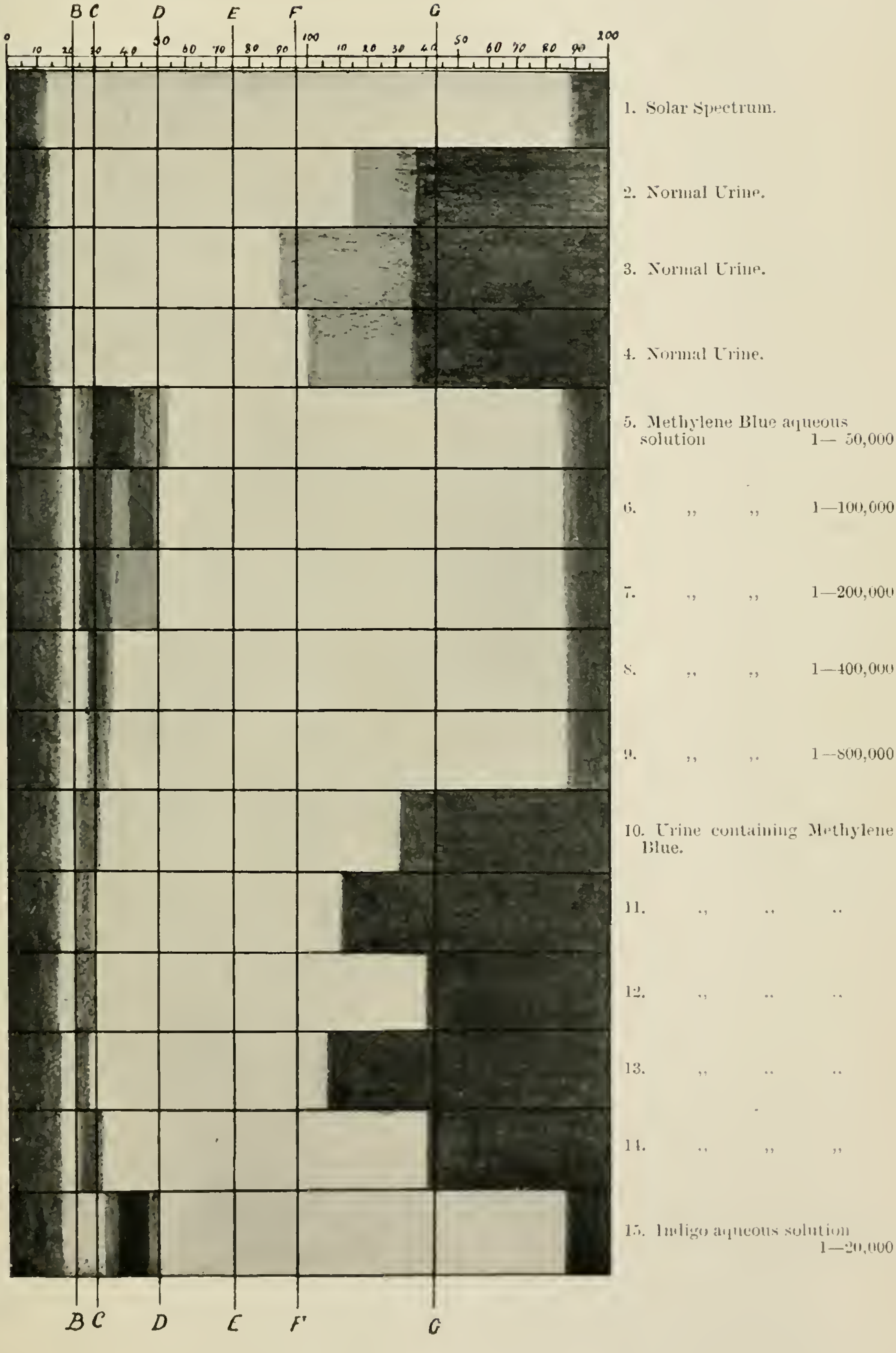
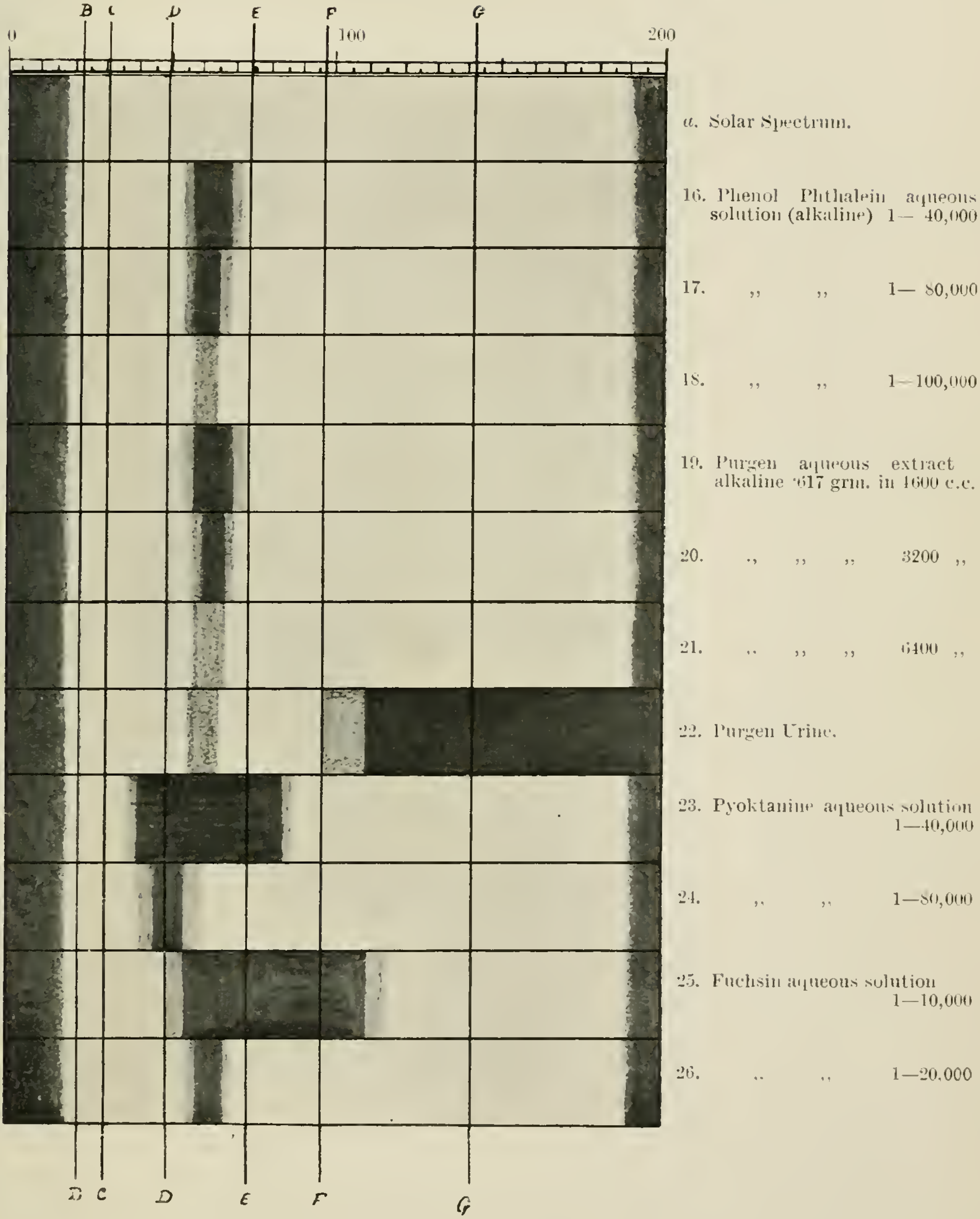

B
C
D
E
F
G
0
10
20
30
40
50
60
70
80
90
100
10
20
30
40
50
60
70
80
90
200
1. Solar Spectrum.
2. Normal Urine.
3. Normal Urine.
4. Normal Urine.
5. Methylene Blue aqueous solution 1— 50,000
6. ,, ,, 1—100,000
7. ,, ,, 1—200,000
8. ,, ,, 1—400,000
9. ,, ,, 1—800,000
10. Urine containing Methylene Blue.
11. ,, ,, ,,
12. ,, ,, ,,
13. ,, ,, ,,
14. ,, ,, ,,
15. Indigo aqueous solution 1—20,000

PLATE XV.


B
C
D
E
F
G
0
100
200
α. Solar Spectrum.
16. Phenol Phthalein aqueous solution (alkaline) 1— 40,000
17. ,, ,, 1— 80,000
18. ,, ,, 1—100,000
19. Purgen aqueous extract alkaline ·617 grm. in 1600 c.c.
20. ,, ,, ,, 3200 ,,
21. ,, ,, ,, 6400 ,,
22. Purgen Urine.
23. Pyoktanine aqueous solution 1—40,000
24. ,, ,, 1—80,000
25. Fuchsin aqueous solution 1—10,000
26. ,, ,, 1—20,000
B
C
D
E
F
G

and finally yellow; the reverse change occurring on the subsequent addition of alkali. On addition of concentrated sulphuric acid, a yellow solution, becoming green, blue, and finally violet on dilution with water, is obtained.

In several urines containing pyoktanin, which exhibited a very faint violet tinge, the above reactions were obtained, but not very distinctly, owing to the minute quantity of the drug present. When, however, the urine was evaporated to dryness in a water bath, and the residue extracted with alcohol, the alcoholic extract then evaporated, and, taken up with water, a reddish-violet solution was obtained which gave the reactions quite distinctly. No spectrum could be obtained with any of the pyoktanin urines, owing to the small quantity of the drug present.

(4) *Fuchsine urines.*—Fuchsine or pararosaniline, a derivative of aniline, has been used in cases of albuminuria. In doses of from 1 to 3 grs. it produces a bright purple urine, but in small doses the urine may be olive-green. It shows a characteristic band in the green resembling that of phenol-phthalein, practically identical with it in position. It may be distinguished from phenolphthalein by the fact that it is soluble in water and is rendered colourless by the addition of alkali, and turns yellow with acids.

A CASE OF AORTIC AND PULMONARY OBSTRUCTION AND INCOMPETENCE, COMPLICATED BY PERICARDITIS WITH EFFUSION.

By Hugh A. Stewart, M.B., Ch.B., *lately Resident Physician, Royal Infirmary, Edinburgh.*

(Plate XVI.)

That the right side of the heart is liable to be affected in cases of acute rheumatism is generally admitted, but to what extent and in what proportion relatively to the left side, still remains a debated point. This uncertainty, more especially in relation to the pulmonary valves, is in part due to the difficulty in making a diagnosis when associated with other valvular lesions, and in part due to the fact that vegetations may be completely absorbed from the pulmonary valves and leave no trace whatever after death.

Although it is in many cases impossible to say from physical examination whether a pulmonary lesion does or does not exist when other valves are affected, the following case is one in which the physical signs are of such a nature that little doubt can be entertained as to the diagnosis, notwithstanding the fact that it has not yet been confirmed by post-mortem examination.

Additional interest is lent to the case by the occurrence of pericarditis with effusion, which ran an unusual course.

Case.—The patient, A. W., æt. 7, was admitted into the Royal Infirmary, under the care of Dr. Gibson, in February 1902, suffering from intense pain over the heart and in the left arm. His father is still alive, æt. 53, and is said to suffer from periodic attacks of ague, which he acquired while serving in the Indian army. His mother is a robust-looking woman, æt. 43. Several of his brothers and sisters are dead, having succumbed to measles and whooping-cough. None suffered from any trouble resembling that complained of by the patient. His home surroundings are far from satisfactory. Both parents are much addicted to alcohol, and they inhabit a room and closet in one of the lowest closes in Cowgate.

The patient had never been a robust child. At the age of 3 he underwent an operation for hernia, and four years later he suffered from a severe attack of rheumatic fever, for which he was under treatment for two months. He had hardly become convalescent when he was seized by severe attacks of angina pectoris of the typical character. The paroxysms of pain would set in without the slightest warning, and they occurred as frequently during the day as during the night. When in a seizure the patient would become fixed in position, not daring to move; he looked very anxious and frightened, and his face became unduly pale. The attacks lasted usually from ten minutes to a quarter of an hour, and as many as six were known to occur in twenty-four hours.

The condition of the child when he was taken to hospital was miserable in the extreme. He was pale and sickly-looking and poorly nourished. The skin was thin and thrown into folds in the region of the groin. The examination of the circulatory system showed that the lesions, which were complex and widespread, were in themselves sufficient to account for the symptoms. The apex beat, which was diffuse in character, was situated in the fifth left intercostal space in the mammary line. At the root of the neck there was very evident pulsation in the carotid arteries and slight dilatation of the external jugular veins, but no evidence of cyanosis. When palpated, the apex beat was forcible and of a heaving character. A diastolic thrill could be felt at the apex, but this had its maximum intensity over the manubrium sterni. The right border of the heart was 1 in. from mid-sternal line and the apex 3 in. The left border, in the fourth intercostal space, measured 2½ in. from mid-sternum. On auscultation of the mitral area a systolic murmur was present, which could be traced into the axilla and upwards over the whole præçordium and into the vessels of the neck. Its point of maximum intensity was in the second right interspace close to the sternum. In the tricuspid area a systolic murmur, indistinguishable from that heard in the mitral area, was present. In the aortic area two well-marked murmurs were heard: a systolic, similar to that heard over other parts of the præcordium, only more intense; and a diastolic, loud and musical in quality, and heard to the right and left of the sternum and half-way along either clavicle. Its point of maximum intensity was situated half-way down the sternum. The pulmonary area presented two murmurs, a systolic—that heard in other parts—and a diastolic, which was blowing in character and differing in quality and intensity from the musical murmur of the aortic region.

It had a smaller area of propagation, being confined to a small region extending from the apex of the heart to the second left rib. It was heard loudest in the third left interspace near the sternum.

Fig. 1 is a reduced tracing showing the areas of propagation of the murmurs and their points of maximum intensity. The pulse was of the water-hammer type—the apex of the pulse wave being sharp and not maintained.

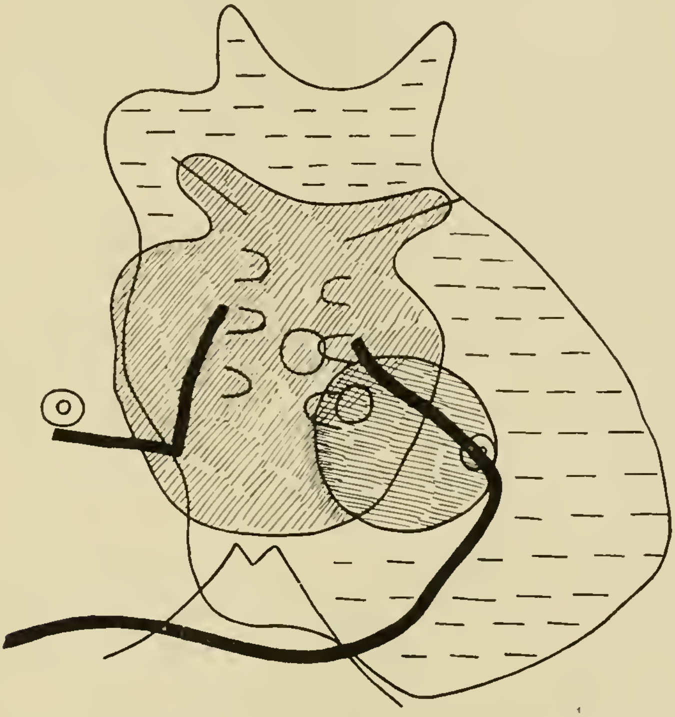


FIG. 1.—Tracing of chest wall, showing the areas of propagation of the cardiac murmurs and their points of maximum intensity.
Systolic murmurs (horizontal etching) ≡
Aortic diastolic (oblique) . . ////
Pulmonary diastolic (oblique) . . \\\\

Capillary pulsation was very evident both in the skin of the forehead when rubbed and in the nails.

Such was the condition of the patient's circulatory system when first admitted into hospital. He was kept under observation and treatment for about two months, during which time the anginous pains disappeared, but the condition of the heart remained much the same as before.

In May of 1905 the patient was again brought to the hospital, with the history that he had taken ill a fortnight previously and was suffering from severe pain in the joints—chiefly the knees and elbows—and a heavy pain over the heart.

On examination, he was found to have a temperature of 103° F., the tongue was densely coated with a whitish-yellow fur, and the skin, moist and of a sour, acrid odour, was covered with numerous sudamina.

A well-marked change had taken place in the condition of his heart. The percussion area presented the appearance seen in the accompanying tracing. The apex was displaced downwards and outwards, and measured 3½ in. from mid-sternal line, the left border was 3 in. in the fourth intercostal space, and the right border 1¾ in. from the middle line.

On auscultation, it was found that the murmurs had altered in intensity, being muffled in tone and only faintly audible. Daily tracings of the area of the heart were made (Fig. 2), and they show that two days after admission a remarkable diminution in size had taken place. The cardiac murmurs were louder, and a faint but distinct pericardial friction sound was heard at the base. On the 5th of June there was again an increased area of dulness, but now no pericardial friction could be heard, nor did it return at any time during the patient's convalescence, although sedulously listened for. The area of cardiac dulness slowly returned to its original dimensions, as is seen in the series of tracings.

Nothing of importance was found in the other systems. The blood, as one would expect, showed a leucocytosis of 21,000 per cubic millimetre, chiefly polynuclear. The spleen was slightly enlarged, reaching to the costal margin. The urine was rather scanty and high coloured, and was deficient in chlorides. Albumin was not present.

The respiratory system was healthy.

From the above description, it will readily be admitted that whatever other lesions exist there can be no doubt as to the presence of aortic obstruction and incompetence. Nothing else will account for the systolic and diastolic murmurs, the water-hammer pulse, and the capillary pulsation.

The interest of the case centres itself, in the first place, in the distinct diastolic murmur heard to the left of the sternum over the third left interspace. That it is distinct and separate from that produced at the aortic orifice is proved by the character of the murmur, which is deeper in pitch and of a blowing character, instead of musical, and by its possessing a different point of maximum intensity. Although one hesitates in making a diagnosis of pulmonary incompetence on account of its extreme rarity, one cannot but infer that such, *inter alia*, exists in this case. It is conceivable that the lesion might be a congenital one, but this is unlikely when one takes the history into account, and from the presence of the associated lesions in the aortic valves, which presumably have been caused by the *Diplococcus rheumaticus*. Further, cases of congenital heart disease are usually attended by a certain amount of cyanosis and clubbing of the fingers, of which there is no evidence in this case.

As to the cause of the pulmonary regurgitation, one is forced to the conclusion that it is the result of a rheumatic endocarditis which has rendered the valves incompetent. One has, however, to keep in view the possibility of a pulmonary diastolic murmur arising in connection with increased pressure in the pulmonary system. This functional murmur has been proved by Gibson to be a not infrequent accompaniment of increased pressure, whereby a stretching of the orifice is produced, thus rendering the valves incompetent. It is unlikely that such is the cause of the pulmonary diastolic murmur in this case, since it has been present for four years, which proves it to be of organic origin. It is not unlikely that the pulmonary valves are thickened, and offer, in addition, a certain amount of obstruction to the flow of blood to the lungs, and that the systolic murmur which is heard over so

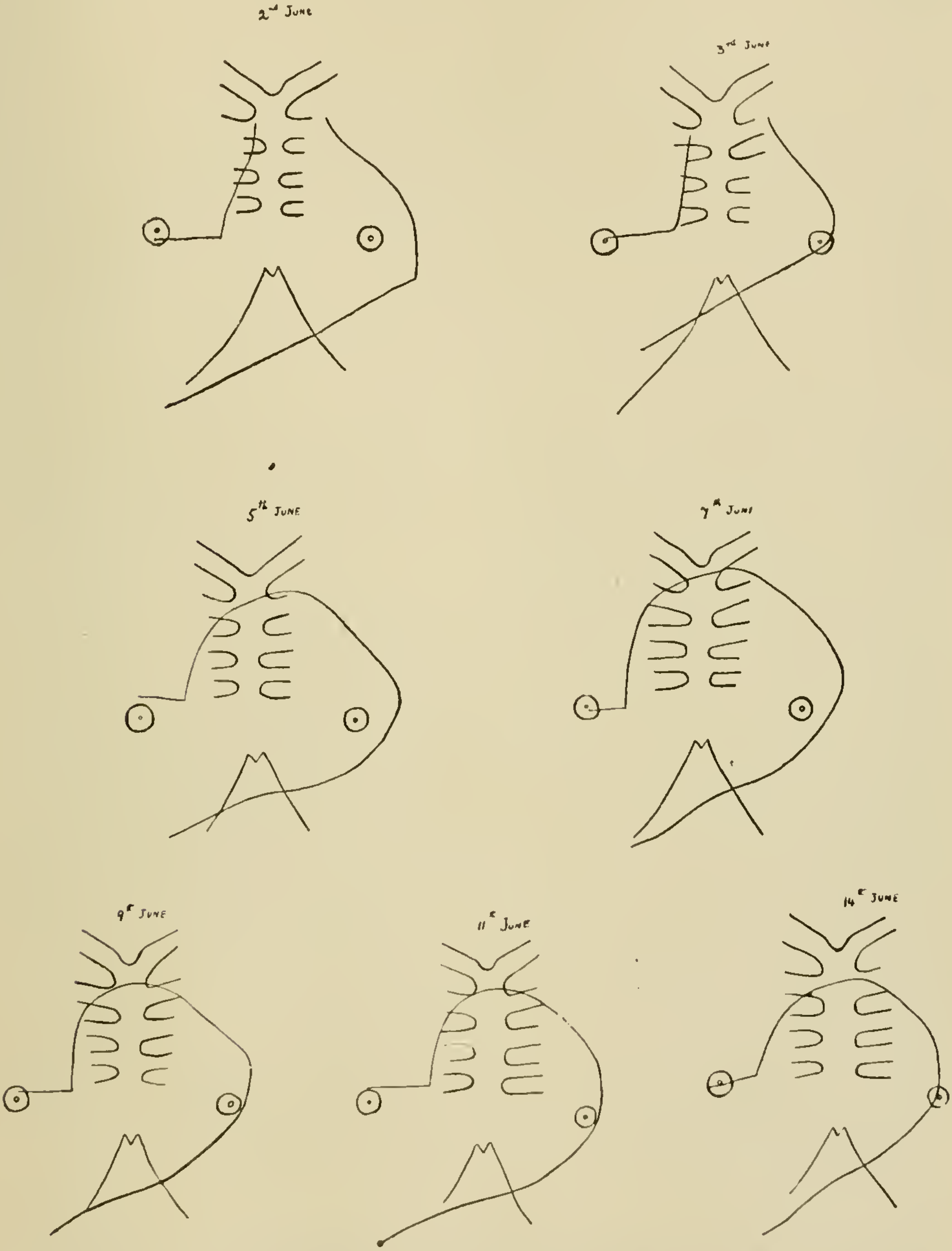


Fig. 2.—Series of tracings of the percussion dulness of the heart, showing diminution on 3rd June.

large an area of the chest wall is produced at the pulmonary orifice as well as at the aortic.

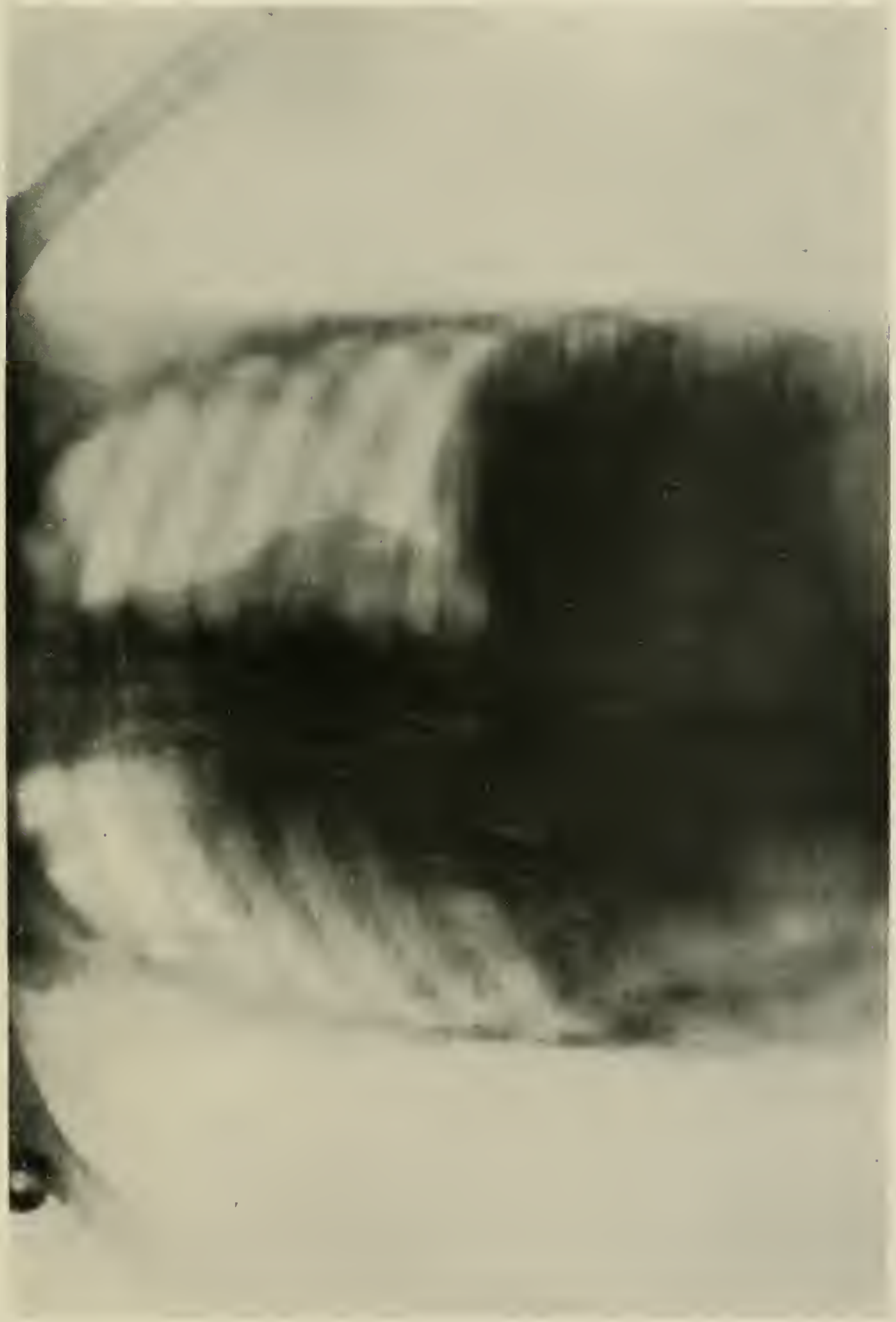
It is worthy of note that this case presents a phenomenon which was first pointed out by Gerhardt, namely, the effect of respiration and posture on the pulmonary bruit. After deep expiration, the cardiac murmurs in general, but more especially the pulmonary diastolic, were intensified and slightly modified in pitch. All the murmurs were rendered more audible when the patient assumed the erect posture.

Attention has been drawn by some writers to the extent of the propagation of the pulmonary diastolic murmur as being of diagnostic value, and Gerhardt has affirmed that the audibility of the diastolic murmur in the axilla and back is distinctive of pulmonary regurgitation. That this does not apply in all cases has been proved by the cases published by Gibson and Boyd and the present one, where the murmur was confined to a small area to the left of the sternum. I venture to express the opinion, founded on a survey of most of the recorded cases and from the present one, that the limitation of the murmur to the left side of the chest and to its entire absence from the right are of more value in coming to a diagnosis.

The subsequent history and the onset of pericarditis with effusion have been considered of sufficient interest to merit a short description.

As has already been mentioned, a sudden diminution in the size of the cardiac dulness took place and was rapidly followed by a return to its original dimensions. Unfortunately an X-ray photo was not taken on the third day of the patient's admission, when the cardiac dulness had diminished, in order that the percussion result could be corroborated. To exclude, however, the possibility of a fallacy arising in connection with the result obtained by percussion, the case was examined by several authorities, who agreed as to the extent of the dulness. Before friction was heard, one had difficulty in deciding as to the nature of the increased cardiac dulness. Knowing the state of the heart before the onset of this illness, one was inclined to regard it as an example of acute dilatation, and this supposition was supported by the sudden diminution in size on 3rd of June. If it were a pericardial effusion, as one might expect, arising in the course of acute articular rheumatism from which the boy was undoubtedly suffering when readmitted, it would be unusual to find the fluid suddenly diminish and as suddenly reaccumulate. As has been noted above, it was only when the cardiac dulness had diminished that pericardial friction was heard, which clearly indicated that pericarditis with effusion was present. Is it possible that at the commencement the heart was acutely dilated, thus preventing sufficient rubbing of the pericardial surfaces to give rise to audible friction, and that this under active treatment had subsided, to

Plate XVI.



From an X-Ray photograph showing increased cardiac area.

be followed by the gradual accumulation of pericardial serous exudate?

I am indebted to Dr. G. A. Gibson for permission to publish this case.

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Boyd.—*Trans. Med. Chir. Soc. Edin.*, 1899, N. S., vol. xviii. p. 41.
Gibson.—*Edin. Med. Journ.*, 1880, vol. xxv. p. 982; "Diseases of Heart and Aorta," 1898, p. 568.

SOME CASES OF HERNIA IN WHICH SEVERAL LOOPS OF BOWEL WERE STRANGULATED IN THE SAME SAC.

By J. Hogarth Pringle, F.R.C.S., *Surgeon, Glasgow Royal Infirmary.*

Ten years ago, within a period of one month, there came under my care two cases of strangulated inguinal hernia, each of which, at operation, presented the, to me, unusual condition of having two loops of bowel strangulated in the same sac and through the same ring; and in 1898 I had a patient who at operation was found to have three loops of bowel strangulated in the same ring.

This condition would appear to be a rare one. I have spoken of the matter to many surgeons of experience, but none of them has been able to tell me of any similar cases. I have not seen it since in any of my own cases, and had not been able to find any reference to the condition in the literature until a paper by Dr. Carl Lauenstein appeared,[1] in which he gives details of four cases of strangulated hernia each of which had two loops of bowel in the sac; and adds, that except for a case of "artificial anus with four lumina," he had not been able to find any cases recorded which bore upon the subject.

The following are brief notes of my own three cases:—

Case 1.—J. I., æt. 27, iron worker, was admitted to Glasgow Royal Infirmary on 2nd February 1896, with strangulated right inguinal hernia. Had suffered from a hernia for six years; never wore a truss; hernia hitherto had always been easily reducible. On the evening of 1st February, after a drinking bout, the hernia came down, and has remained irreducible. Has vomited frequently; flatus has not passed. The bowels acted once during the night. A medical man tried to reduce the hernia both without and with anæsthesia, but failed, and sent him to hospital for operation.

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[1] *Deutsche Ztschr. f. Chir.*, Leipzig, Bd. lxxvii.

There is a very large scrotal hernia at the upper and inner part, of which there is a firmer portion which is very tender. Operation at once. In the sac two loops of bowel were found, one lying anterior to the other; the anterior loop, about 6 in. in length, was of a deep purple colour, with some blood diffused into its coats and somewhat thickened from œdema; the posterior loop, about 14 in. in length, was not nearly so deeply congested as the former, and the two rings of constriction were much more pronounced on the anterior than on the posterior loop. Both loops and the portions of bowel immediately continuous with them appeared to be in a viable state, and were returned, though reduction only succeeded by getting the posterior loop reduced first. The patient made a good recovery. No doubt the "firmer portion, which is very tender," felt at the upper and inner part of the tumour before operation, was the thickened anterior loop of bowel.

Case 2.—R. H., æt. 55, engineer, seen 26th February 1896; has had a right inguinal hernia for fourteen years, and for which he has worn a truss. To-day, while stepping from a railway carriage, the truss broke, and the hernia came down and has been irreducible since. Soon after the hernia came down he began to vomit. Operation at once, and found two loops of bowel, the anterior 6, the posterior 4 in. in length. Reduction succeeded by getting the posterior loop up first. Patient made a good recovery.

Case 3.—W. M., æt. 38, labourer, admitted to Glasgow Royal Infirmary on 3rd June 1898. Hernia of fourteen years' duration. He wore a truss for some years, but later discarded it. Has several times had symptoms of obstruction (vomiting, constipation, and temporary irreducibility of the hernia), but they always passed off. The hernia came down on this occasion while he was at stool the evening previous to operation; he failed to reduce it, and so did a medical man who tried taxis with anæsthesia; he has been vomiting frequently since it came down, and no flatus has passed. Patient has a large scrotal hernia. At the operation, which was carried out at once, a long loop of bowel of a deep purple colour presented; behind it, two other loops of bowel were found, one, the central one, of a deep red colour only a few inches long, and the posterior one many inches in length, natural in appearance and colour. There were six rings of constriction, those of the anterior loop being most pronounced and those of the posterior loop least marked. Reduction was only possible taking the loops from behind forwards. Radical operation. During the next twenty-four hours he passed many large tarry motions. He was dismissed well.

In none of these cases was there any omentum in the sac; in all three, reduction was only effected by replacing the most posteriorly situated loop first. In the first case a good deal of time was lost in a fruitless attempt to get the anterior loop reduced before the posterior, but in the other two cases I began by trying to replace the posterior loop, and reduction was effected easily in the third case, and in the second patient decidedly more easily than in the first, but not so readily as in the third.

Here, then, are three cases, in two of which there were two loops of bowel, and therefore four rings of constriction, and one case with three loops and six rings of constriction, and it must be at once obvious that a patient with a hernia of this type runs a risk decidedly greater than that of a patient who has only one loop of bowel strangulated. There is an extra loop that may become gangrenous, but, as appears from Lauenstein's experience, there is still a further risk, the possibility of which had not suggested itself to me when dealing with my own cases; it is, that the loop of bowel inside the abdomen which connects the two herniated loops may become gangrenous without either of the external loops evidencing much change from the normal.

When operating upon my cases, I did not consider it necessary to examine the state of the connecting loops further than to draw down the bowel, as one always does in every strangulated hernia, far enough to form an opinion as to their condition at the points of constriction and immediately adjacent to these; and as in all three cases the bowel so drawn down appeared to be viable, a more extended examination was not made, and the herniated loops were returned into the abdomen. Fortunately, my cases all recovered.

Lauenstein's first two cases recovered. In the third patient, the connecting loop was found to be "deep blue-black, leathery in consistence, its serous coat roughened, and it exhibited no peristalsis," so was excised. This patient died.

In his fourth patient, while the external loops were tolerably normal, the connecting loop was gangrenous, and had given way on its convexity at three points, the three openings having irregular margins.

Lauenstein considers that the occurrence of gangrene in the connecting loop is due to the agency of bacterial invasion, and it seems probable that this view is correct. It appears almost certain that it cannot be due to mechanical interference with the vascular supply of the connecting loop. The connecting loop was seen to be freely supplied with branches from the left side of the superior mesenteric artery, the main trunk of which was observed passing down towards the pelvis to supply the more distal of the two herniated loops and the lowest part of ileum continuing on from the latter to the cæcum. Except by a process of thrombosis spreading along the vessels supplied to the proximal herniated loop, and thereby causing a block of either the mesenteric artery or vein, an unlikely occurrence, the vascular condition of the connecting loop must remain practically normal.

Whether the several loops of bowel found in the sac in these cases are herniated at once, or one after another, is a point that is not of very great importance.

In my second case, the hernia coming down at the moment of the breaking of the truss, it is practically certain that both loops of bowel found in the sac were herniated at the same moment, and it is very probable that in the third case also, the patient straining at stool, the several loops came down all together. This case very specially shows that the degree of vascular obstruction to which each loop may be subjected is varied, for the congestion was very decidedly less in each loop in order from before backwards. And in the first case I noted that "the anterior loop was of a deep purple colour," and "the posterior loop not nearly so congested as the former," and also that "the rings of constriction were more pronounced on the anterior loop than on the posterior," so that the anterior loop, in contact with the more elastic and contractile structures of the inguinal canal, seems to me to undergo a greater degree of constriction than, and possibly acts as a sort of buffer to, the posterior loop lying on the inelastic Poupart's and Gimbernat's ligaments.

I have thought it worth while to bring these cases forward, for the condition is one of importance; the possibilities in connection with it being, First, that the several loops outside the abdominal cavity may become gangrenous, apparently without involvement of the connecting loop, hence there may result an artificial anus with multiple lumina. Secondly, the internal connecting loop or loops may become gangrenous without gangrene of the external herniated loops. Thirdly, it is to be presumed that the herniated loops, along with the connecting loop or loops, may all become gangrenous.

In all cases of this type the important point is to determine the state of the connecting loop which, blocked at both extremities, is unable to get rid of its contents forwards or backwards, and, probably in consequence of this and the increased fermentative changes which go on inside, it is liable to have its vitality gravely interfered with.

It becomes incumbent, then, upon any surgeon who meets with a similar state of things, during an operation, to examine carefully the connecting loop throughout its whole length, however good the appearance of the herniated loops may be.

RECURRENT ACUTE INFLAMMATION OF THE MASTOID PROCESS.

By W. G. Porter, M.B., B.Sc., F.R.C.S.E.

(*From the Poliklinik of Privatdozent Dr. Gustav Brühl, in Berlin.*)

Secondary operations on the mastoid process, where the antrum has previously been opened for acute inflammation, have occasionally to be performed; the indication for such an operation is usually either subsequent involvement of neighbouring important structures in the inflammation, or a failure of the parts to heal. The cases which I propose to describe in this paper are essentially of a different order. In them an acute inflammation of the middle ear, accompanied by caries of bone in the mastoid process, has necessitated the performance of the classical or Schwartze's operation. Healing has been complete, but a return of a similar condition on one or more occasions has again called for a similar operation.

I have had the opportunity of seeing these cases while working in Dr. Brühl's poliklinik, and have watched the later stages of two. By his kind permission I am enabled to publish an account of them, and for this I thank him most heartily.

Recurrence of acute inflammation of the middle ear is, of course, a common phenomenon, and there is no *a priori* reason why each attack in such a case should not be accompanied by inflammation of the mastoid process requiring operation. It is, however, well known that only a very small percentage of cases of otitis media acuta require opening of the antrum, and it is surely, therefore, remarkable that one person should be unfortunate enough to suffer in this way on more than one occasion. With this brief justification for this paper, I pass to an account of the cases themselves, which I extract from the journals of the clinic.

Case 1.—This patient was first seen on 20th March 1900, then æt. 7 months; she had had discharge from the right ear for fourteen days; and for three days a swelling had been noticed behind the ear. An operation was performed on the day following admission. An incision was made over the swelling; pus was evacuated; a sinus was found opening on the surface of the mastoid process, and leading to the antrum; the latter was full of granulations; all diseased bone was removed with the sharp spoon. Healing was uninterrupted, and was complete on 6th April.

On 28th September 1901 the patient was brought back, suffering from earache, which had lasted a week. On examination, the drum membrane was found to be red and bulged, and a slight swelling was observed behind the ear. Paracentesis was at once performed; a large quantity of pus escaped. Three days later the paracentesis had to be repeated; after a further period of three days, a fluctuating swelling had appeared behind the ear; an operation was therefore performed. An incision was made through the swelling; about half an ounce of pus was evacuated. A sinus was found opening on the surface of the mastoid process, at the level of the upper margin of the bony meatus; this and the antrum contained granulations. The latter was laid freely open, and the cavity was curetted. Healing was rapid, being complete on 21st October. The patient was seen again on 10th May 1905; there was then swelling and redness of the cicatrix behind the right ear, and she complained of giddiness and vomiting. She had been ill only for two days; during the three and a half years which had elapsed since the previous operation, she had remained perfectly well. An operation was at once performed. An incision was made behind the old cicatrix; rather less than a drachm of pus escaped; a sinus was found opening some 8 mm. behind the spina supra meatum; the bone was widely undermined, and contained granulations. The posterior wall of the meatus was greyish-white in places. The whole of the diseased bone was removed, the antrum being opened. Paracentesis was performed; healing progressed slowly; the cavity behind the ear did not fill with granulations, but it was gradually lined by epidermis; the process was completed by the end of the year. On 10th March 1906, on examination, a large circular depression is seen behind the right ear, lined by thin skin, about a third to half an inch in depth, and with a diameter of about half an inch. The drum membrane is atrophic; whisper is heard at from three to one and a half metres. Small glands can be felt in the left side of the neck.

Case 2.—The patient, a boy æt. 8, was operated on for the first time on 17th May 1902, for mastoid abscess, after being ill for a few days. An incision was made behind the left ear; pus was evacuated. A sinus was found opening on the surface of the mastoid process; the antrum was laid open. Healing progressed very slowly, the formation of granulations being scanty; further delay was caused by an infiltration of the soft parts in October, which caused the wound, which had then almost closed, to open up again.

On 4th April 1903 healing was complete; a cicatrix could be seen in the drum membrane.

On 14th May 1904 the patient came again to the poliklinik, having had earache for a day. The drum membrane was found to be red and bulged, and there was pain on pressure over the mastoid process. Whisper heard at a distance of a quarter of a metre. On 19th May an operation was performed. An incision was made behind the old cicatrix; about a drachm of pus escaped. A sinus was found opening behind the spina supra meatum; the mastoid cells were full of granulations; the posterior wall of the meatus was also involved, necessitating the removal of its outer third. The old cicatrix was excised. On 26th June the wound behind the ear had healed; there was a small perforation in the drum membrane. On 10th March 1906, the ear continues to discharge slightly; on examination, the handle of the malleus is found to be retracted and adherent to the promontory wall; there is a marginal perforation in the posterior inferior quadrant, in which small granulations can be seen. Behind the ear there is a depressed scar, the depression is more marked in its lower half. There are two small scars in the neck, the result of glandular abscesses. Whisper heard at 4 metres.

Case 3.—The patient was first seen on 17th July 1903, then æt. 4. He had recovered from scarlet fever a fortnight previously. For two days he had had pain in both ears, and discharge from the right ear; both drum membranes were red and bulged. On the following day paracentesis was performed on both sides. On 21st July there was marked bulging of the posterior wall of the meatus on the right side. On 24th July an operation was performed. An incision was made behind the right ear; a sinus was found opening into the meatus, this communicated with the antrum. The posterior wall of the meatus was removed as far as the opening of the sinus, and the antrum was laid open. On removing the carious bone the lateral sinus was exposed; its wall appeared healthy. On 19th September healing was complete;

whisper was heard at 4 metres. On 19th July 1904 the patient returned complaining of pain in the right ear, which had lasted some days. The drum membrane appeared red, but not bulged. This attack passed off under palliative treatment. On 20th May 1905 he again returned, complaining of pain in the ear and discharge from it, which had begun on the previous day. On 22nd May the cicatrix behind the ear was red, and fluctuation could be elicited. An operation was therefore performed. An incision was made through the old cicatrix; pus was evacuated. A sinus was found opening on the surface of the mastoid process. The antrum was opened, and on scraping away granulation tissue the lateral sinus was exposed; the latter appeared healthy. Paracentesis was performed, and the old cicatrix was excised. On 27th July healing was complete; whisper was heard at 4 metres. On 10th March 1906 a cicatrix was seen in the drum membrane in its posterior inferior quadrant; behind the ear there was a long, very considerably depressed cicatrix. Whisper was heard at a distance of 4 metres; the patient had remained well since the previous operation.

Case 4.—The patient was first seen on 8th May 1903, then æt. 5. He had had discharge from the left ear for ten days following on a sore throat. On examination, he was found to be suffering from acute inflammation of the middle ear. This attack, passed off under palliative treatment. He had two similar attacks, beginning on 20th July and 27th July respectively. After the former had passed off, enlarged tonsils and adenoid vegetations were removed. On 28th August he returned again; three weeks previously he had had scarlet fever; since then there had been discharge from the left ear. The drum membrane was red, and there was a perforation in the anterior inferior quadrant. The ear continued to discharge till 5th October, the discharge then ceased, and simultaneously a swelling appeared behind the ear; the patient also vomited. On the following day a definite abscess had formed behind the ear, and there was bulging of the posterior wall of the meatus; an operation was therefore performed. An incision was made through the swelling; pus was evacuated; a sinus was found opening on the surface of the mastoid process. All diseased bone was removed, and the antrum, which was full of granulations, was laid open and curetted. Paracentesis was performed. Healing was uninterrupted, and was complete on 19th November; whisper was then heard at a distance of 6 metres. On 5th December the patient again returned with pain in the left ear, following on a cold in the head. The drum membrane was red and bulged, and there was a perforation in the posterior inferior quadrant. 12th December.—Healed. On 9th July 1904 he had a similar attack. This had passed off on 10th August; whisper then heard at 6 metres. He returned on 30th January 1905, having had pain in the left ear for three days; the scar behind the ear was inflamed. On the following day fluctuation could be elicited behind the ear, and there was bulging of the posterior wall of the meatus; paracentesis was performed. On 1st February a large abscess had formed behind the ear; an operation was therefore performed. An incision was made in the old cicatrix; a large quantity of pus was evacuated. A sinus was found opening on the surface of the mastoid process, and leading to a large cavity, which contained granulations, and which extended downwards to the tip of the mastoid process and backwards to the lateral sinus. The wall of the latter appeared healthy. The cavity was curetted, and paracentesis performed. Healing took place rapidly, and was complete on 24th March. Whisper was then heard at a distance of 6 metres. On 31st July, after a few days' illness, the patient returned with an abscess behind the ear; an operation was at once performed. An incision was made in the old cicatrix; about half an ounce of pus escaped. The old operation cavity was found full of granulations; the lateral sinus lay exposed, its wall appeared healthy. The cavity was curetted, and paracentesis was performed. Healing took place rapidly, and was complete on 14th September. A marked depression was left behind the ear. On 20th November the patient returned with pain in the left ear. The drum membrane was red and bulged, but there was no perforation. On 23rd November the inflammation had subsided; the scar behind the ear was markedly depressed.

Case 5.—This patient was first seen on 29th January 1904, then æt. 18 months. She had had discharge from the ear since the preceding October. In November the family doctor had incised a swelling which had formed behind the ear; this had healed. The swelling had reappeared on the day preceding the consultation. On examination, the drum membrane was found to be red and bulging; paracentesis was performed. No adenoid vegetations were present in the naso-pharynx. On the following day fluctuation was elicited behind the ear. On 1st February 1904 an operation was performed. An incision was made through the swelling behind the left ear; pus was evacuated. A sinus was found opening into the external meatus; through this a probe could be passed into the antrum; the caries extended throughout the mastoid process. The antrum was opened, and all diseased bone removed. Paracentesis was performed. On 22nd February the drum membrane of the right ear was bulged, and there was a perforation in the posterior inferior quadrant. On 25th February paracentesis was performed on that side. On 28th April both sides had healed. On 7th May there was a recurrence of the acute inflammation on the right side. This had passed off on 17th May. The patient remained well till 26th May 1905, when she returned with discharge from the left ear. The drum membrane was red and perforated in the anterior inferior quadrant. On 2nd June the right ear was similarly affected. On 5th June an abscess had formed behind the left ear; an operation was performed. An incision was made in the scar, about a drachm of pus escaped; a large sinus was found opening on the surface of the mastoid process; the antrum was opened, the cavity was curetted, and paracentesis was performed. During the healing, which was complete on July 17th, the formation of granulations was scanty, and an unusually depressed scar resulted. On 10th December the drum membrane was atrophic; there was marked depression of the scar behind the ear.

Case 6.—This patient was seen on 29th October 1904, then æt. 9. He had had discharge from the right ear for three days. The drum membrane was bulged, and there was a small perforation in the anterior inferior quadrant. There was marked tenderness on pressure over the mastoid process. On 2nd November an operation was performed. An incision was made behind the ear; the antrum was opened; it contained granulations, and the surrounding bone was carious. Paracentesis was performed. Healing was complete on 16th February 1905. Whisper was heard then at a distance of 3 metres. The patient returned on 27th February; he had had pain in the ear for a day; the drum membrane was bulged and red; the scar behind the ear was red and swollen. An operation was performed on the following day. An incision was made in the old cicatrix; a large quantity of pus was evacuated. The antrum was readily exposed on scraping out some granulation tissue. On 29th April healing was complete. On 23rd August the patient returned complaining of pain in the ear. The scar was red and tender on pressure. The symptoms subsided without operative treatment. On 5th October he returned again; the drum membrane was bulged, and the scar was red and tender on pressure. Paracentesis was performed. On 12th October the radical operation was performed; pus was evacuated on making the incision, and a sinus was found opening on the surface of the mastoid process. On 7th December healing was complete; whisper was heard at a distance of 1 metre.

REMARKS.—In the literature of the subject, so far as I have had access to it, I can find no notice of a recurrent acute inflammation of the mastoid process, such as is illustrated by the above cases. Similar cases have no doubt been previously observed, but possibly no special significance has been attached to them; the occurrence, however, of such a series of cases in a comparatively short period of time compels attention, and calls for a more careful study.

Zaufal[1] has published cases of pneumococcal mastoiditis where the symptoms of involvement of the mastoid process were delayed, an operation being required at an interval varying from a few days to three weeks after cure of the middle ear inflammation, and where further a reaccumulation of pus appeared not infrequently very shortly after the operation wound had healed. These anomalous symptoms were probably caused, as Zaufal suggested, by pus being encapsuled in the mastoid process and later becoming active. These cases, then, though having at first apparently some similarity, are of a different class to those described above. To turn to the latter, we notice that all occur during the period of infancy and childhood; the patients vary in age from seven months at the first operation on the youngest to ten years at the last operation on the oldest. They all belong to the poorer classes, and are for the most part somewhat below the average as regards development and nutrition, though the general conditions of life are in all cases satisfactory. None show evidence at the present time of any general disease, nor could a family history of syphilis or tuberculosis be elicited.

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[1] *Prag. med. Wchnschr.*, 1889.

The immediate cause of the first attack in two of the cases—Cases 3 and 4—was scarlet fever; in the others it was probably a cold. It should be stated here that when adenoid vegetations were present they were removed in the early stages of treatment. The course of the first attack presents no special features, the operation being performed within fourteen days of the initial symptoms, except in Cases 3 and 5, where the intervals were two and three months respectively. At the operation an abscess was found behind the ear in every case except Case 6; the pus had escaped through a sinus which opened into the meatus in two cases, and on to the surface of the mastoid process in the remaining three. The bone disease was fairly widespread, so much so that the caries extended in two of the cases to the lateral sinus. Healing was complete within three months in every case except Case 2, where the process lasted ten months; the development of granulations in that case was extremely scanty. The drum membrane healed in every case, and a fair amount of hearing was regained.

The subsequent attacks occurred from two weeks to two and a half years after recovery from the first. In three—Cases 1, 4, and 6—there were three attacks. In Case 4 there were in addition six attacks of acute inflammation of the middle ear, uncomplicated by mastoid inflammation; and in Cases 3 and 6 there was also one such attack; while in Case 5 there were three such attacks on the side which was not operated on. In the first recurrence, in Case 6, the interval of health was so short that I think we may assume that a focus of pus was for a time encapsuled; after a short time was disseminated, and rapidly reinfected the middle ear and mastoid process. In the other cases the interval was too long to allow of this explanation.

The great similarity in the sequence of events and in the appearances found at the operation in the various cases must at once strike us as remarkable. The interval between first symptoms and operation did not exceed a few days; in those cases where there was a third operation, the incubation period was still shorter. Further, at the operation, an abscess was found in every case behind the ear, the pus having escaped through an orifice which opened on the surface of the mastoid process—*i.e.* on the site of the previous operation opening In the two cases where the disease extended to the lateral sinus at the first operation, this was again found exposed at the second. This would suggest that the regeneration of bone in these cases had been incomplete. Finally, the deep cavity now present behind the ear in the first case is a demonstration that here at any rate there was no regeneration of bone after the last operation. To make the significance of this point clearer, let me first briefly consider the conditions which are known to be present in every case of acute middle ear suppuration. The pus in the middle ear obtains entrance through the aditus into the antrum, and any air containing cells opening directly into the latter; the mucous membrane lining the antrum participates more or less in the inflammation; but if the bone is not affected, the antrum acts merely as a reservoir; the pus can be reabsorbed, and the parts return to the normal when the inflammation in the middle ear has subsided. Now, supposing there were a space leading from the antrum to the surface, or even a poorly vascularised tissue, the inflammation could spread more easily and rapidly instead of remaining confined to the mucous membrane as it usually is. In other words, there would be another path of infection just as the squamo-mastoid suture when present is a path of infection, and these cases would be analogous to those sometimes occurring in children where a subperiosteal abscess may form without caries of bone, the pus having escaped through the squamo-mastoid suture.

Now, as regards regeneration of bone, it is known that very large defects, even the whole diaphysis of a long bone, can be regenerated after subperiosteal excision for osteomyelitis, and there is no *a priori* reason why the small amount of bone removed in opening the antrum should not be entirely regenerated. Clinically, the final result is, if healing takes place, that a more or less depressed scar is left, suggesting that at the surface at any rate the regeneration of bone is incomplete.

I can find but little in the literature of the subject on the failure of regeneration of bone after operation on the mastoid process. Gerber[1] reports the case of a girl, æt. 8, where, after an operation at which the lateral sinus and the dura mater of the middle cerebral fossa were exposed, the wound healed, but without any regeneration of bone, so that those structures were finally covered only by a layer of true skin. He suggested as a possible reason for this, that as a subperiosteal abscess had been present for a considerable time before the operation, changes had occurred in the periosteum which prevented it from producing bone. This case was, so far as the author knew, unique. Karewski and Schwabach[2] have published more recently a similar case. The patient, a man, æt. 22, was operated on for thrombosis of the lateral sinus. The wound healed, but without regeneration of bone. The lateral sinus in this case also was afterwards covered by skin alone. The defect in the bone was later made good by an osteoplastic operation. The authors attributed the failure of the regeneration of bone here to the severity of the osteomyelitis.

Now we know that certain constitutional conditions, especially syphilis, tuberculosis, and diabetes mellitus, are unfavourable to the regeneration of bone. As regards syphilis, I have already stated that there was no evidence of that condition. Tuberculous disease may also, I think, be eliminated, as the clinical course of the attacks in these cases is by no means suggestive of that affection; further, the granulations which were removed at the operations were in nearly every case stained for tubercle bacilli and examined, with a negative result. Moreover, none of the patients suffer from diabetes mellitus. The general condition of the patients was, however, not very favourable for repair. Possibly in this factor, taken in conjunction with the severity of the inflammation, we are to find the explanation.

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[1] *Arch. f. Ohrenh.*, Leipzig, Bd. lxiii.
[2] *Berl. klin. Wchnschr.*, 1905.

The question then arises, Why are these cases uncommon? assuming that they are not frequently met with. The answer to this is, I think, that probably in such a case healing usually never takes place, and so a recurrence is impossible.

The fact that all these cases occurred during childhood or infancy, suggests that the anatomical conditions peculiar to this age must play a part; this is probably the case to a minor degree. The presence of the squamo-mastoid suture does not, however, come into account, for, as we have already seen, the pus made its way either into the meatus, or on to the surface of the mastoid process apart from that suture. The relative closeness of the antrum to the surface may, however, well play a part; that we must not lay too much stress on this point is to be seen, I think, from the apparent infrequent occurrence of such cases.

There are two conclusions of practical importance that I think should be drawn from a study of these cases:

1. That at a second attack of acute inflammation of the mastoid process it would probably be wiser to perform the radical operation, or, if preservation of better hearing power than is usually obtained after this operation is of great importance to the patient, to merely open the antrum, and later to graft bone on some other material in the operation cavity, after the latter is relatively aseptic.

2. We have in these cases an additional reason to be conservative in our treatment of acute inflammation of the mastoid, for we cannot be sure beforehand that there will not be recurrences necessitating further operations.

CLINICAL RECORDS.

CONGENITAL PAROXYSMAL CYANOSIS WITH POLYCYTHÆMIA, IN A GIRL ÆT. 16 YEARS.

By F. PARKES WEBER, M.D., F.R.C.P. (Lond.), *Physician to the German Hospital, London, and the Mount Vernon Hospital for Chest Diseases, Hampstead.*

CASE.—The patient, Caroline H., is rather tall, though thin and physically weak.[1] She appears to be mentally normal, and can read and write, though, owing to her having never been able to regularly attend school, she has not learned to spell correctly. Her colour varies greatly from time to time. Sometimes it is almost natural, but on any physical exertion or mental effort or excitement she becomes more or less cyanosed. Her lips, nose, and fingers may then become bluish-black, and the cyanosis can likewise be observed in her eyelids and cheeks, but is less obvious in her ears and toes. There is scarcely any "clubbing" of the fingers, and none of the toes.

Heart.—The apex beat is in the fifth left intercostal space, just inside the nipple line. The præcordial dulness commences above at the fourth rib; it extends outwards to the apex, and scarcely reaches the sternum on the right. In fact, when the patient lies on her back, a strip of resonance can be percussed out between the cardiac dulness and the sternal margin, but it must be mentioned that the chest is not quite symmetrical, there being some bulging of the ribs (of rachitic origin?) to the left of the middle part of the sternum. No thrill can be felt. By auscultation a systolic murmur can be heard all over the heart, which varies much in loudness from time to time, but is probably never altogether absent. It is loudest over the central cardiac area in the fourth intercostal space, but is sometimes nearly as well heard close to the left of the sternum in the third space. Occasional intermissions or incomplete contractions have been noted. On the whole, therefore, examination of the heart seems to show that the total volume of the organ is not much too great, but, nevertheless, by the help of Röntgen rays (Dr. Schuh), a bulging of the right side can be detected, as if it were relatively abnormally large in comparison with the size of the left side and of the whole heart.

There is no evidence of any disease in the lungs or in the abdominal viscera, or (by ophthalmoscope examination) in the eyes. The liver and spleen are not enlarged; the urine shows nothing abnormal; it is of rather low specific gravity, and certainly does not suggest any passive congestion of the kidneys. Neither is there any œdema or distension of the superficial veins of the extremities to suggest failure in the circulation.[1] The pulse varies considerably in frequency (84–120), and is of rather low pressure (brachial blood pressure about 108 mm. mercury, as estimated by the Riva-Rocci apparatus with the broad band). Examination of the blood obtained by pricking the finger on 29th March 1906 showed that the red corpuscles were greatly increased in number, as they often are in cases of cyanosis from congenital heart disease. There were 7,352,000 red cells and 17,000 white cells in the cubic millimetre. A differential count of white cells (500 counted), kindly made on that occasion by Dr. A. E. Boycott, gave polymorpho-nuclear neutrophiles 67·2 per cent., lymphocytes 15·6, intermediates 6·4, large hyalines 7·6, eosinophiles 2·8, mast cells 0·4. The red cells seemed quite normal; no variation in size was observed, nor were any nucleated red cells seen. Hæmoglobin (8th April 1906), 130 per cent. of the normal.

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[1] This case was shown by Dr. Weber at the Clinical Evening of the Medical Society of London, 9th April 1906.

The patient shows no congenital abnormality beyond that in the circulatory system. According to the mother's account, her birth was natural and at full term, and no blueness was noticed until she began to walk (at the age of 2¼ years). The blueness was always observed to vary much in degree from time to time, and to be increased by any physical exertion or any mental effort (such as doing lessons) or any excitement. She seems only once to have fainted, and that was when she was at school at the age of 6 years. Menstruation commenced at 14 years, and since then has been regular and of average amount. She has never been able to get about much, but in the summer of 1905 she was able on one occasion to walk a mile or so, resting occasionally on the way. She is very subject to headaches, and mental efforts seem to be as difficult for her as physical efforts. As a result, she has not learned to spell properly, but her memory does not seem to be really defective. There is a chronic tendency to constipation. In regard to the cyanosis, there has, according to the mother, been certainly no improvement, but the trouble has rather increased with her age. Though the patient has always been very delicate, she was able to get over whooping-cough at about 3 years of age and scarlet fever in her sixth year. A sister of the patient, æt. 9 years, is imbecile and backward in physical development.

REMARKS.—In our opinion the only way to account for the symptoms is to suppose that there is an abnormal aperture in the inter-ventricular septum, with fairly equal development of the muscular walls of the two ventricles. The murmur is probably not due to pulmonary stenosis, but, according to published necropsy results, some form of pulmonary stenosis is probably present. It is known that congenital pulmonary stenosis may be present without giving rise to a murmur, at least to any constant murmur. The murmur may, however, be due to the inter-ventricular opening, as its position of maximum intensity corresponds fairly well to that of the inter-ventricular septum. It appears that a defect in the inter-auricular septum (whether in the position of the foramen ovale or in an independent position) does not by itself give rise to similar symptoms, nor does patency of the ductus arteriosus (Botalli). The variations in the degree of cyanosis may be accounted for by varying obstruction in the pulmonary circulation. The attacks, or rather exacerbations, of cyanosis in the present case are apparently not as striking as they were in G. Variot's and other cases which were collected by J. Sébilleau in his thesis,[1] and the anatomical conditions in the present case may not be exactly the same as those recorded in necropsies on the French cases. In one of Variot's patients, the well-known physiologist E. J. Marey, after he had had the opportunity of examining the heart removed at the necropsy, suggested that spasm of the muscular infundibulum (an anatomical peculiarity in that case) of the pulmonary artery was a possible cause of the paroxysms of cyanosis which were observed during life.

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[1] There are some thin purplish scar-like "striæ patellares" above the patella on each leg, the exciting cause of which is (in this case as in some others) quite uncertain. In fact, the patient was not aware of their presence until she was asked about them.

Our present case seems to throw some light on the question of the cause of cyanosis in congenital heart disease. It is well known that cyanosis is often not observed in cases of congenital heart disease, and when it is noted, Stillé and Peacock have argued that it may be accounted for by congestion of the venous system. Our case, however, may be reckoned amongst those which confirm the old view that cyanosis in congenital heart disease may be due, not to any sluggishness in the circulation, but to the admixture of venous and arterial blood owing to abnormal communication between the two sides of the heart.[2] Though the cyanosis is of such old standing, the patient does not as yet present any sign of venous congestion, such as enlargement of the liver, œdema of extremities, scantiness and abnormal concentration of the urine, or special distension of large veins. Nevertheless, it should be remembered that the increased viscosity of the blood, resulting both from the excessive number of corpuscles and (according to J. Bence) from the excess of carbonic acid gas, must tend to hinder the circulation and produce compensatory dilatation of the small blood vessels.

In the case of the present patient, it is found that when there is tachycardia, from excitement or any other reason, the cardiac murmur may be so little marked that it may easily escape notice on auscultation of the heart.

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[1] "Congenital Paroxysmal Cyanosis," Paris, 1904.

[2] On this whole question, see Dr. D. B. Lees, "Case of Malformation of the Heart," *Trans. Path. Soc. London*, 1880, vol. xxxi. p. 58.

A CASE OF HEART CLOT.

By Skene Keith, M.B., F.R.C.S.Ed., *London.*

The notes of a case of hysterectomy followed by symptoms pointing unmistakably to a heart clot may be of interest, as the accident is one of the most alarming that can happen; that is to say, when the patient recovers. In other cases, death is so rapid that it is not possible to be in time to see the patient alive.

Case.—The lady was æt. 49, unmarried. She was of a very nervous type, and had always been delicate. I had seen her occasionally with Dr. Harper in the past ten or twelve years, as she had suffered at times from indefinite pains in the abdomen. Seven months before the operation, she began to suffer from constant pain in the lower part of the abdomen; she described it as being of a very severe forcing down character. There was also a very tender and painful spot above the umbilicus. As it was impossible to make a satisfactory examination on account of the rigid and thick abdominal walls, she was anæsthetised, and it was then found that there was a small fibroid tumour of the uterus with its base running into both broad ligaments, more especially into the left. The uterus was very tightly jammed down into the pelvis. Both Dr. Harper and I were agreed that there should be no operation if it could be possibly avoided, for two reasons: first, on account of the patient's general condition, which was a very unfavourable one for surgical interference; and secondly, the age, more especially as there had never been any menorrhagia. In my experience, while the menopause is usually delayed until about 54 when there is menorrhagia, it is more likely to occur about 50 when this symptom is absent. Arguing apparently from the unusual cases, one sees it sometimes stated that it is ridiculous to believe that fibroid tumours of the uterus ever cease to grow. That such a statement is not correct I know from my own knowledge. The pain steadily increased, and whenever the patient sat upright it was always at its worst. We tried every palliative means we could think of, but had at last to suggest to the patient that if there were no improvement very shortly, the time would have come when we had waited long enough, and that there was nothing else for it but the operation. After a few weeks' consideration, the patient agreed with us that she must obtain relief somehow, and consented to have the tumour removed.

The operation was performed in the middle of September. On opening the abdomen, the left Fallopian tube was seen exactly in the middle line, the enlarged uterus having made a quarter turn, the base was broad in comparison to the size, and the upper part of the growth had, by turning backwards, enclosed several coils of small intestine in the pelvis. It is difficult to explain how this came about, as the growth was not large enough to reach to the pelvic brim behind. On putting the hand into the pelvis, it seemed at first that the intestines were adherent, and it was only after using quite a considerable amount of force, that the coils could be drawn out, the Trendelenburg position not helping at all. The coils of intestine were somewhat contracted, but the walls were swollen, soft, and of a bluish-red colour, and it appeared to me that the pain was probably caused by the pressure of the fibroid on them. The tender and painful spot near the navel may also have been caused in the same manner. There were no other points of interest to be noticed about the operation. For the first fortnight nothing could have been more satisfactory than the progress the patient made, with the exception that she could not pass her water in the recumbent position. She was therefore allowed out of bed for this purpose on the twelfth day.

At 7.20 on the morning of the fifteenth day, as she was being helped back into bed, she suddenly complained of feeling very ill. The nurse's description was, that the patient had become very grey in colour, the breathing was shallow and quick, and no pulse could be felt. I was telephoned for. In the meantime a mustard leaf was put over the heart, and brandy was given both by the mouth and the rectum. I arrived within forty minutes of the attack. At that time both the face and lips were colourless, the respirations were very shallow, the pulse could barely be felt but not counted, the heart seemed to be contracting about 180 times in the minute, and the sounds were not at all clear. The lady realised that she was very ill, and felt that she could not live many minutes. Ether was injected freely, without producing any result; and there was no apparent improvement until the oxygen, which had been sent for, arrived. It was not procured till nearly 8.30. The patient had not been inhaling it many minutes when she began to look a shade better. The pulse could not be counted until 10.30 A.M., when it was made out to be 136. At that time the patient still felt that she was dying. As the day passed, there continued to be a little improvement; and by night the pulse had slowed down to 128, respirations 32. The treatment consisted in the hypodermic injection of strychnia and digitalin, at first every two and then every three hours. Very little food was taken, but brandy and champagne were swallowed freely, the patient feeling the need for frequent stimulation, though when in her usual health she does not take any alcoholic beverage. The inhalation of the oxygen had to be continued without interruption for the first twenty-four hours, several attempts to stop it for a time proving unsuccessful. The pulse did not fall below 120 for five days, and by that time the oxygen could be dispensed with, its administration having been gradually lessened as the patient could do without it, after the first day. On the twenty-fourth day after the operation, and the ninth after the heart attack, there was distinct friction heard at the left base both behind and in front, the pulse quickened to 128, the respirations to 34, and the temperature rose to 102°. This was followed by some effusion into the pleural cavity. On the fifty-sixth day the patient complained of pain in the right groin and thigh, most severe in the outer part of the thigh. The same evening the calf of the leg was slightly swollen, and next day the whole of the leg and thigh were much enlarged. The worst seat of the pain had now moved to M'Burney's point in the abdomen, and to the centre of Scarpa's triangle in the thigh. The temperature was 102°·6 and the pulse 108. In spite of this, the patient was allowed to get out of bed when necessary, as the catheter had been used for five weeks out of eight, and there was a slight tendency to bladder irritation. The pain and fever gradually lessened, and had disappeared in six days; and, a few days after that, the patient for the first time since the operation lost the feeling of illness which she had had all through, and at last began to think that there was a possibility of her recovery. The fomenting which had been kept up for some days brought out a red irritable rash at the two points where the pain had been most severe.

In my book on abdominal surgery I reported five cases of heart clot, with only two deaths. Since then I have seen one case, in consultation after a confinement. In this case there was a very long illness, one complication following another in a most extraordinary manner, but the patient eventually recovered. Adding the present case, the number is now seven, with two deaths, the two having occurred within a couple of minutes of the attack. This is a mortality probably much less than is usually supposed, and seems to point to the great probability of recovery if the patient survives the first few minutes. In this case the inhalation of oxygen was of the very greatest service; indeed, I doubt very much if the patient would have recovered without its use. It also lessened the feeling of oppression and sense of impending death.

A CASE OF SAVIN POISONING.

By John R. Hamilton, M.D., *Hawick.*

Case.—On 26th September 1903, at midnight, I had an urgent message to visit a young woman, S. C., whom the messenger said had been suddenly seized with violent pains. I accompanied the messenger, and found on arrival at the house that my patient was in very great agony. She was lying with firmly clenched hands, and rolling her body from side to side of the bed. She had a deeply flushed face, and her features were distorted. She was quite sensible, but at first would answer no questions. Her mother told me that she had come into the house in a bad temper, a little before 11 o'clock, had gone to her room without speaking to any one, and nothing more was heard of her until a few minutes before I was sent for, when they were aroused by her screaming. I at once saw she was well advanced in pregnancy, and suspected some ecbolic. I sent for the stomach tube, and meantime forced her to swallow a quantity of hot water. I encouraged vomiting by tickling the throat, and this occurred most fully. In the vomited matter I noticed what appeared to be dark skin, but what I found to be the gelatine covering of pills. She then admitted that she had taken some pills. I examined the room and found the lid of a pill-box, with a number and directions for use upon it. I instructed the brother to take this to a police-constable, and request him to find out from the chemist what the box had contained. This information the chemist refused to give. I was then satisfied that the pills contained something unlawful. Meantime I had washed out the stomach well. The pain, however, did not abate. I injected $\frac{1}{3}$ gr. of morphia, applied hot fomentations over the abdomen, and the legs being now cold, I applied mustard from the knees downward. About 1 o'clock diarrhœa began, at first yellowish, then a grass-green liquid in large quantity at each motion. At 2.30, she appeared to be sinking, and I injected $\frac{1}{100}$ gr. of digitalin and $\frac{1}{100}$ gr. of strychnine. I sent a message for a neighbour, but he was out. There was now, however, a slight rally of the pulse. The pain became more bearable, and the facial appearance better. I waited until 3.30. I again saw her at 8 A.M. (Sunday), pulse very weak, face drawn together as if wizened with age, sunken eyes, and altogether a pitiable object. I was sent for at 10.30 A.M., as her friends thought she was dying. She was pulseless. I again injected digitalin and strychnine, bandaged the legs, and administered a large enema of tepid water. She wavered between life and death all day, rallied at night, but was weaker again on the 28th. The green-coloured diarrhœa still continued. Dr. Affleck of Edinburgh, who was seeing another case with me, kindly saw this patient, and agreed with me, that it was most likely a case of savin poisoning. That night the chemist admitted to the procurator-fiscal that the pills contained savin. The green diarrhœa continued for five days, and there was absolute suppression of urine for two, then the urine was bloody for nine days. We discovered that she was five and a half months pregnant. She made a very slow recovery, and suffered from irritable stomach and diarrhœa. On the fifth week after taking the savin she was confined of a still-born male child, and it was some weeks before she was able to leave her bed; the convalescence being complicated by phlebitis of the right leg. She was not really well for six months.

She had swallowed twenty-three pills, each of which contained—

Purified aloes	$\frac{1}{2}$ gr.
Pulv. rue	$\frac{3}{4}$,,
,, saffron	$\frac{3}{4}$,,
,, savin	$\frac{3}{4}$,,

These pills were ordered to be taken three times a day, and this was the second box she had bought. The first not having had the desired effect, she tried the pills in bulk, with the result described.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

Radiotherapy in Skin Disease. By Dr. J. H. Belot. Translated by W. Deane Butcher, M.R.C.S., Surgeon to the London Skin Hospital. London and New York: Rebman Limited.

The value of the X-rays as a therapeutic agent having been thoroughly recognised and universally accepted, attention is now mainly directed to the best and safest modes of utilising them, and already numerous treatises concerned with their application have appeared. To our French neighbours we are indebted for many of the most useful improvements in the mechanical elements of their genesis, among others the names of Gaiffe, Villard, and Chabaud have only to be mentioned to recall at once special instruments or devices familiar to every operator. It is thus by no means surprising that one of the best manuals on the subject should emanate from a Gallic source, and this volume by Belot, excellently rendered into English by Butcher, will be found a trustworthy and eminently up-to-date guide. It opens with a succinct description of the measures in use for the production of the rays, according to the needs or facilities available in each individual case. But the chapter devoted to methods of exact mensuration in radiotherapy is perhaps that of most consequence, and the one to which the reader almost instinctively turns with intense interest. For the results of radiotherapy depend on our power of estimating the quantity and the quality of the rays being utilised, as well as on our appreciation of the amount absorbed in a given time by the tissues of the patient submitted to them. Were it possible to estimate these conditions with perfect accuracy, then the dangers which, however minimised, still to some extent exist, would cease to occasion anxiety. Though all the most recent arrangements for computing and appraising them are here recapitulated, yet it must be owned that entire precision is still unattainable. So long as determination of the exact amount absorbed depends on our valuation, by the sense of sight, of delicate alterations in shade of colour, no common standard can be reached, and this is what Holtzknecht's pastilles or Sabouraud's and Noiré's wafers demand. However, though by these means it may be barely practicable to assess the proportion of rays absorbed, we can now by the milliampèremeter of Gaiffe determine the strength of the current which passes through the focus tube, and so by the exercise of care, aided by practice, ensure immunity from any serious risk, while accomplishing our intended aim.

While a modifying influence on the integument and its annexes, the hair and nails, is conceded, it is of consequence to decide what effect is produced on internal organs, such as those contained in the abdominal cavity. The conclusion arrived at is, that in practical radiotherapy we may rest assured that, under the conditions obtaining in practice, no injurious action on internal organs is to be feared. As a recent development is the rapid treatment of ringworm of the scalp by the rays, it is of moment to know that no harm will be done to the child's central nervous system. It would appear that the thickness of the cranium is sufficient to safeguard the brain entirely, the radiations being almost completely arrested. As a corollary from this, it may be held that in the present state of our knowledge, any curative effect on deep-seated tumours can hardly be expected; and this indeed is Belot's experience, for he says: "In our own practice we have not met with any signs of success—in the cure of internal cancer,—but this may possibly be due to faulty technique."

One-half of the volume is devoted to a detailed account of the application of the rays to a large number of cutaneous disorders, the experience of hosts of observers being compared, when possible, with that at the Broca Hospital, during a period of rather over a year. The list of skin diseases, for the treatment of which the rays have been invoked, is a long one, indeed they have apparently been tried in all the more common and in as many of the rarer as have been accessible. One most important service they have rendered is that by their aid we can curtail the duration of a number of obstinate complaints, some of which were all but incurable within a reasonable time by the means hitherto had recourse to. Thus the epilating properties of the rays have been utilised in reducing the time occupied in the cure of ringworm of the scalp in children, from years, in some cases, to weeks or months; in obtaining a mastery over favus unknown before, the forcible extraction of the hairs, a tedious and painful process, being now replaced by their spontaneous fall. In sycosis, little impression was often made by systematic evulsion of the incriminated hairs, combined with the use of ointments of the most diverse composition; now, a single exposure of twenty minutes, or a series of shorter ones, is followed by entire denudation of the part affected, by immediate subsidence of swelling and inflammation, and by permanent cure, provided that suitable applications are subsequently employed. We agree with Belot that in lupus erythematosus they do not seem to give better results than other methods of treatment, but our experience is more favourable than his in lupus vulgaris. On cancer of the skin he speaks with some confidence, for the largest number of cases treated by him belonged to this class. "We do not assert that cancer of the skin can be permanently cured by this method. What we do affirm is that radiotherapy temporarily removes the objective symptoms of nearly all cutaneous neoplasms, that the cicatrices are most satisfactory, and that the chances of recurrence are less than in any other mode of procedure." One might perhaps demur to the last sentence if early excision is included. On the whole, the author is neither unduly optimistic nor pessimistic, and he has produced a work of great value to the practitioner of medicine.

The Treatment of Venereal Disease and Scabies in the Army: Final Report of Advisory Board for Army Medical Services. London: Eyre & Spottiswoode.

In the November number of the Journal the opinion was expressed of the three previous Reports, that they contained a vast amount of valuable information which, although primarily intended for army surgeons, might by assimilated with profit by civilian members of the profession. This, the final Report, presents the principal conclusions to be drawn from what has gone before, together with practical recommendations as to treatment.

The prevention of venereal disease is discussed upon lines which will meet with the approval of every one who has studied the subject at first hand. Although the Contagious Diseases Acts formerly in force in this country had the approval of the great majority of the medical profession, and were repealed, largely by the influence of lay sentiment, it must be admitted that the compulsory isolation of a particular section of infected persons, namely, of diseased prostitutes, cannot be considered to be an ideal method of arresting venereal disease while large numbers of infected persons of both sexes remain free to spread the contagion. It is noteworthy that in foreign countries where the police supervision of prostitutes has been carried out much more strictly than was ever attempted in Great Britain, serious doubts are now expressed as to the efficacy of legal restraint in arresting the spread of venereal disease. In Sweden, where the presence of syphilis has dimished to a remarkable degree during the last half-century, it is believed that the main factor in bringing about this diminution has been the effective and, if necessary, gratuitous treatment afforded by State hospitals to patients of both sexes without the stigma associated with police compulsion. The committee responsible for the present Report has come to the conclusion that an attempt to grapple with the problem of venereal disease by methods of compulsory isolation and treatment is neither practicable nor expedient. Better results are likely to be obtained by the diffusion of the knowledge of the serious consequences of these diseases, and the provision of effective treatment for both sexes under conditions to which no personal stigma is attached.

The remainder of the Report deals with the treatment of the different forms of venereal disease. It is an admirable piece of work, and reflects great credit on the Medical Department of the Army.

A Practical Treatise on Sexual Disorders. By ROBERT W. TAYLOR of New York. Third Edition. London: Henry Kimpton.

THIS edition of Taylor's well-known work has been revised and amplified, and the number of illustrations has been considerably increased. The anatomy and physiology of the male organs, and the composition of the various secretions derived therefrom, are considered with a minuteness of detail which is not to be found in text-books of anatomy or physiology, but which is essential for the special study of sexual disorders. The important subject of impotence receives its proper share of attention, and in the description of the organic causes of this condition there is included a resumé of the diseases of the penis, nearly every one of which is graphically illustrated. Sterility is considered under the heads of azoöspermatism, whether due to organic changes in the secreting apparatus or to abnormal conditions of the semen, and aspermatism, in which the final stage of the sexual act is wanting. Chronic inflammations of the urethra and prostate and seminal vesicles are described on instructive and practical lines, with a tendency, however, on the part of the author to claim as his own, opinions and methods of treatment many of which were originated by Guyon and the French school of genito-urinary surgeons. The remaining chapters closely resemble the corresponding ones of previous editions.

Landmarks and Surface Markings of the Human Body. By Louis Bathe Rawling, M.B., F.R.C.S. Second Edition. London: H. K. Lewis.

The appearance of a second edition of this little book within twelve months of the first affords ample proof, if that were needed, of its appreciation by students of medicine. It describes and illustrates the more important landmarks and surface markings in a clear and concise manner. The present edition is larger by twenty pages than its predecessor, and while the number of illustrations remains the same, several are modified or have been replaced by new ones; the representation of the kidneys, as seen from behind, is still open to criticism.

Atlas of Illustrations of Clinical Medicine, Surgery, and Pathology. Fasc. xix., xxi., xxii., xxiii., and xxiv. London: The New Sydenham Society.

These volumes, coming from a society which has done so much pioneer work, are full of interest and instruction. In reproducing old and rare cases they are very helpful, but one could wish that the reproductions of more modern cases were improved.

Fasciculus xix. deals with herpetiform morphœa, and emphasises the neurotic origin of the condition. Plate 101, showing the "spotty" early stage of the disease, is particularly valuable, as also are a series of photographs showing atrophy of subjacent tissues. Fasciculus xxi. illustrates sarcoma melanodes, ringworm, pityriasis rosea, and flea bites. From the reproductions it would be difficult to diagnose ringworm or pityriasis rosea; the latter does not show the raised margin generally noticeable. In the letterpress on this latter condition its sporadic nature is emphasised, but we have often seen them in series. Again, sulphur baths are suggested for treatment, but no mention is made of permanganate of potash baths, which are much more beneficial in most cases. Fasciculus xxii. embraces leucoderma, myxœdema, drug eruptions, etc. In the first of these the photographs, being taken from dark races, are very effective, and the accompanying letterpress is full and good. Fasciculus xxiii. shows a number of eruptions following on the administration of iodide of potash. One would have desired a more accurate history as regards renal disease in these cases, but the series is very representative of the severer types. Fasciculus xxiv. contains bromide eruptions, lichen urticarius, and a specially good plate of pemphigus vegetans.

The atlas is a good one, and its authors deserve every praise for the care and patient work they have bestowed on its production. If for future numbers they could obtain reproductions from painted casts, they would still further benefit their readers.

Practical Sanitary Science. By David Somerville, B.A., M.D. London: Baillière, Tindall, & Cox.

In his preface the author states that this book is "a brief summary of the course of practical lecture-demonstrations given to the D. P. H. class at King's College, London." Like the majority of books on such lines, its value is much diminished by the condensed manner in which it is written, and which will necessitate frequent reference on the part of the student to other text-books for further details on many points which might well have been included in the volume. The chapter dealing with the analysis of soils occupies only a little over two pages—surely a very limited amount of space for such a subject. Similarly the bacteriological examination of water is dismissed in about the same space. The illustrations, especially those of the microscopical appearances of starches, parasites, cotton, wool, etc., are well executed, and the appendix contains a considerable amount of information as to the preparation of the commonly used standard solutions, the solubility of various chemical substances, etc.

The Preparation and After-Treatment of Section Cases. By W. J. Stewart McKay, M.B., M.Ch., B.Sc., Sydney. London: Baillière, Tindall, & Cox.

We can heartily congratulate Dr. McKay on the way in which he has accomplished the task he set himself of doing something to lessen the preliminary troubles of those "who are beginning section work." Throughout the book there is much internal evidence that the author has spared no pains to verify his statements by personal observation, and we could well believe, even had he not assured us in the preface, that he has spent many hours at the bedside of his patients (we prefer the word to "cases," which our author persistently employs) watching and noting the varying phases of their progress after operation.

It may be strictly logical to include the building of an operating theatre and the construction of sterilisers and operating tables among the preparations for a "section case," but much that is contained in the first seven chapters might well have been spared from a work ostensibly devoted to a special class of operations, even at the expense of logical continuity. Nearly a hundred pages are thus occupied with a detailed description of the machinery and general technique of operative surgery with which even "those who are beginning section work" must be assumed to be familiar.

For the chapters devoted to the after-treatment of pelvic operations we have nothing but praise, particularly for the sections dealing with such subjects as vomiting, hiccough, thirst, pain, sleep, and the feeding of the patient. Here the reader will find a mine of eminently useful information. The various complications of such operations also are dealt with in a thoroughly practical way, and no one can fail to obtain help by consulting these pages when face to face with a difficult case. The illustrations have been judiciously selected to illustrate the text, and a full index renders the work easy of reference.

Physical Diagnosis. By RICHARD C. CABOT, M.D. Third Edition. London: Baillière, Tindall, & Cox.

THE work proceeds along the lines usually followed in manuals on the methods of clinical medicine. The scope of the work is, however, limited to those subjects with which the author is personally familiar. All else, for example, ophthalmoscopic and laryngoscopic examination, is strictly excluded. The book contains over 570 pages, about 300 of which are devoted to the respiratory and cardio-vascular systems. The reader finds an admirable account of the methods of examination, the physical signs in the various diseases and their differential diagnosis. About 90 pages are allotted to the abdomen, stomach, liver, intestines, kidney, urine, etc. The examination of the nervous system is briefly considered in 16 pages.

Throughout the work the author tells us what he considers important and unimportant. Methods and physical signs which he regards as of value are always fully and clearly described. Thus attention is drawn to the value of Litten's diaphragm phenomenon or shadow, it being held that the diaphragmatic movements can be studied more easily, and upon the left side more plainly, by means of Litten's phenomenon than by the Röntgen rays. On the other hand, some methods which many clinicians regard as valuable are not described. No account, for instance, is given of the sphygmograph, because the author believes that it reveals nothing of practical diagnostic value which cannot be appreciated by the skilled fingers.

There are six plates, numerous illustrations in the text, including a number of radiographs, and an accurate and well-arranged index.

Sex and Character. By OTTO WEININGER. London: Wm. Heinemann.

THIS is a very curious book. In the modern civilised world there has grown up, since the time of the troubadours, a pretty and romantic, but somewhat unreal, view of woman. She is, or ought to be, according to this idealised view, a being gentle and pure and good, by nature much higher, finer, more akin to the angels than the brute her husband. Scientifically, however, we know her as the female of the mammal man, differing from him innately—mentally and physically—on the average, about as much as the females of other mammals differ from their males. Like man, she has her reproductive instincts which impel her to fascinate and be fascinated, and so forth. But on reaching adult life man is forced to earn his living in the sweat of his brow. Denied equal strength and opportunity, and burdened with an unequal share of the troubles of reproduction, woman is forced to find some man to earn a living for her. She must sexually excite, and it is an extremely good thing for all concerned that she tends to be sexually excited in turn. All this seems to us very obvious and not intrinsically deplorable. It is probable, therefore, that sexual matters, speaking broadly, interest women more than they do men—which is not the same thing as saying that they are more sensual. The individual woman may or not be that. The author of this volume began life apparently with the conventional view, and then made the discovery that he was mistaken. He "could not bear the burden of his ghastly knowledge," and committed suicide—a remarkable action for a philosopher, especially a philosopher of twenty-one. His work is interesting mainly from the point of view of morbid psychology.

Clinical Obstetrics. By Robert Jardine, M.D. (Edin.), F.R.S., Professor of Midwifery, St. Mungo's College, Glasgow. Second Edition. London: Rebman Ltd.

In bringing out a second edition, Professor Jardine has made several alterations. While the present edition has fewer pages than the edition of 1903 the pages are larger, a change which makes the volume less handy than the previous edition. The general plan of the book remains unaltered, and, as before, it is eminently a practical book, in which the author gives the reader the results of a wide clinical experience.

To the clinician the value of the book is enhanced by the incorporation in the text of notes on illustrative cases. In the present edition the number of such cases has been much increased, nine further cases of eclampsia have been added, thus bringing the total up to thirty. Though Professor Jardine has added fifty new illustrations, his total still remains under a hundred, thus contrasting very favourably with many of the modern text-books, where the reproduction of photographs far exceeds the needs of the text. It is a pity that in a book dedicated "To those obstetricians who are endeavouring, by aseptic methods, to do for midwifery what has already been done for surgery," the author should find a place for such illustrations as those on pp. 478 and 479, where the person who holds the forceps, and who presumably has applied them, is seen garbed in a street-coat, the cuff of which is barely turned up! In chap. xliii. there is a very interesting record of the anatomical abnormalities found on dissection of a child, with defective development of the limbs, which survived birth six months.

All interested in the practical aspect of obstetrics will welcome this enlarged edition of a book which so amply justifies its claim to the title, "Clinical Obstetrics."

On Leprosy and Fish-eating. By Jonathan Hutchinson, F.R.S., etc. London: Archibald Constable & Co. Ltd.

One cannot read this book without admiring the persistence of the author, who fights his cause in the face of the opposition of all the leading workers on the subject of leprosy. A great many facts are set forth in the usual lucid and fascinating style of the author, which seem to give support to his theory, and no one who wishes to make a careful study of this hideous disease can afford to neglect the work of Mr. Hutchinson. At the same time we feel that the author has not succeeded in carrying conviction "that the fundamental cause of the malady known as leprosy is the eating of fish in a state of commencing decomposition." That unknown "ingredient" in decomposing fish may produce serious effects on the human organism, but we feel that it is taxing our credulity too much to ask us to believe, without one scrap of evidence, that it may so modify the bacillus of tuberculosis that its staining reactions, its cultural capabilities, and its effects upon the tissues are profoundly changed, and this is only one of the properties claimed for this unknown "ingredient." We confess that a very careful examination of the facts brought forward has left us more convinced than ever that the "fish-eating" theory as presented by Mr. Hutchinson is in the face of facts quite untenable.

Atmokausis und Zestokausis, in der Gynækologie. By Von Dr. LUDWIG PINCUS. Zweite verbesserte Auflage. Wiesbaden: J. F. Bergmann.

THAT this book should have reached a second edition in the space of three years is sufficient tribute to the recognition which the work of the author has received from gynæcologists, both in his own and other countries, as a valuable addition to the therapeutics of diseases in women. The present volume will do much to remove a certain amount of prejudice to the application of vaporised steam to the uterus, and ought to still more encourage its use as a therapeutic agent. The application of a new method of treatment to a large number of different conditions, and its supposed efficacy in their treatment, is apt to raise suspicion as to its real value in any one of such conditions. In the present work Dr. Pincus does not claim Atmokausis as a therapeutic agent in a large number of pathological conditions, but sets down very clearly the indications and contra-indications for its use. More than half of the volume is devoted to the history and technique of its application, the second portion dealing with the treatment as applied to special conditions; and although in the earlier part there seems to be an unnecessary degree of repetition and reference to observations of doubtful importance, the information on the treatment of disease in the special part is presented in a concise and interesting form. The chief indication for its application is uterine hæmorrhage of all forms, and it is in these conditions a most valuable addition to treatment, especially in those bleedings occurring about the climacteric, which have not infrequently necessitated the performance of hysterectomy. All forms of inflammation of the uterus uncomplicated by affections of the adnexa are much benefited by the application of steam. Malignant disease, tumour growth, and inflammations of the Fallopian tubes and ovaries, are the conditions in which their use is contra-indicated.

Thirty-three drawings and plates illustrate the text in various parts of the book, which is written in the characteristic German style.

By the completion of this volume the author has still more firmly established the claims of Atmokausis und Zestokausis as a valuable therapeutic agent, and presented in a clear and practical form the suggestions first advocated by Snegirew.

The book can be thoroughly recommended as a useful addition to any library.

Laboratory Manual of Physiology. By FREDERICK C. BUSCH, B.S., M.D. London: Baillière, Tindall, & Cox.

THIS book is a new departure in the method of presenting experimental physiology to the student. It runs to nearly 200 pages, and includes practical chemistry and some histology. Descriptions and illustrations of apparatus are for the most part omitted, as are also the results and conclusions of the experiments described. It is an American book, and in America the students have opportunities for experiments on live animals which are quite impossible here, consequently a large portion of the book contains material which is of little practical value for the British student of medicine. As an example of some of the experiments, the operative procedures for removal of the pancreas in the dog and of the suprarenals in the rabbit are described; in fact, a large part of the book is a manual of operative surgery. The scope of the work is enormous; and if the student were to carry out all of it, he would have had a good training in operative surgery and clinical medicine in addition to practical physiology. There are many very useful suggestions, and the directions bear evidence of having been carefully rehearsed. The book is a useful laboratory guide for consultation where some unusual experiment is to be performed, but is hardly suitable for the use of the average student.

The Medical Epitome Series. Edited by VICTOR COX PEDERSEN, A.M., M.D. London: Hodder & Stoughton.

THIS is a comprehensive series of small handbooks primarily intended for the use of medical students, and embracing the entire realm of Medicine. The object of the projectors has been to provide a maximum amount of information for a minimum price, and it must be admitted that the task has been performed, on the whole, in a very creditable manner.

The handbook on "Medical Diagnosis" evidences much care in its compilation, and Dr. Hollis is to be congratulated not only on the accuracy and clearness displayed, but upon his sense of proportion. We can cordially recommend this little manual.

Dr. Hughes Dayton is responsible for the manual on the "Practice of Medicine." This also is an excellent little book, and is quite up to the standard of the former.

In "Nervous and Mental Diseases" there has been some laxity in revision of final proofs, as betokened by frequent typographical errors. Moreover, the author's explanation of the cause of Romberg's symptom in locomotor ataxia as being due to a "defect in controlling the muscles from *impairment of sensation*," is apt to create a wrong impression in the mind of the very young student, in spite of the fact that impairment of the muscular sense is referred to in the same article. Potassium iodide in doses of a half to one ounce per diem will scarcely recommend itself to the majority of practitioners on this side of the Atlantic. The handbook on "Surgery" is also little calculated to become popular in the British Medical Schools, and the same can be said of those on "Physiology" and on "Anatomy."

"Obstetrics," "Pediatrics," "Diseases of the Skin," "Diseases of the Eye and Ear," and "Genito-Urinary and Venereal Diseases," are all admirable in their way, and cannot but be useful to those desirous of possessing clear, concise summaries of the various branches of medicine severally treated.

"Microscopy and Bacteriology" is already somewhat out of date, but doubtless the publishers will see to this in succeeding editions.

"Clinical Diagnosis and Urinalysis" is well written, and to be commended, but the use of colour in portraying the characteristics of the films in the various blood conditions would add immensely to its value.

"Normal Histology," "Physics and Inorganic Chemistry," and "Organic and Physiologic Chemistry," have also been judiciously compiled, and can be cordially recommended.

On the whole, the "Epitome Series" will be found to answer the purposes for which these little books were intended, and the support accorded to them in this country will doubtless justify still further attempts to keep them thoroughly up to date. They are wonderful value for the money.

A Manual of the Diseases of Infants and Children. By JOHN RUHRÄH, M.D. Philadelphia and London: W. B. Saunders & Company.

IN criticising this book, it is but right that the great difficulty, we might almost add, impossibility, of the task which the author has had in view should be borne in mind. Dr. Ruhräh has tried to give, in concise form, a synopsis of the diseases of children "to enable the student to grasp quickly the more important parts of the subject of pædiatrics," and this volume of under 400 not very closely set pages is the result. If the writer had adhered closely to the intention of his preface, and had restricted himself to a practical consideration of common maladies and those peculiar to childhood, he could, in the space at his disposal, have produced a useful manual; but it seems to us that he has erred by attempting too much, and that, on the whole, the accounts given of diseases are too schematic to be of any great value; the book would, of course, prove serviceable to a student wishing to revise for an examination; we would not, however, do Dr. Ruhräh the injustice of suggesting that this was in any way his desire. Although we have had to speak adversely of the general execution of the book, it is pleasant to be able to commend it in three important features. The subject of infant-feeding is ably treated, though naturally from the American standpoint; there is an excellent chapter on therapeutics, which cannot but be useful; and, third, a most judicious selection of references greatly enhances the value of the book. When a second edition is called for, the volume should be carefully revised, as in many places evidences of haste are apparent. Thus, in the section on infectious diseases, the very important matter of the duration of infection is not referred to, except in the case of measles; that bronchial catarrh is a leading symptom of typhoid fever in the young ought to have been mentioned. Again, posterior basic meningitis is usually attended by high fever at the onset. The short note on pyuria is quite inadequate, and there are many other omissions for which space might be got by the deletion of matter which the student will readily find in the 15,000 pages of text-books to which such pathetic reference is made in Dr. Ruhräh's preface. We also plead for more careful proof-correcting, and less inaccuracy in the spelling of proper names: Boivard, Goodlee, Friendwald, Grave's disease, and Colles's law have an unfamiliar look, as of friends in disguise, while "Poynton and Pogue" made us rub our eyes for a moment.

Die Krankheiten des Verdauungskanals. By Dr. PAUL COHNHEIM. Berlin: S. Karger.

IN this handbook the diseases of the digestive tract are treated of first and foremost from the standpoint of the practising physician, and the result is, on the whole, a serviceable treatise, in which stress is laid chiefly on the anamnesis and ordinary clinical methods for arriving at a diagnosis, chemical analysis of the gastric contents being dispensed with, except where absolutely necessary. As a fundamental matter from the point of view of therapeutics, the necessity of ascertaining whether a malady is organic or functional is repeatedly insisted upon. Dr. Cohnheim attaches quite undue importance to the presence or absence of *pain* in distinguishing the two classes of maladies; to quote his own words (p. 4), "a purely functional stomach affection is never accompanied by pain." This is far too absolute a rule, and, in practice, would be most misleading. To ascribe all forms of painful dyspepsia to organic disease is certainly an error; surely, for example, the pain of gastric flatulence is a very genuine article. Hyperchlorhydria, attended by pain, is regarded by Dr. Cohnheim as a symptom of acid gastritis or ulcer, and is thus rather arbitrarily brought within his definition. It is difficult, however, to believe (and the author adduces no arguments in support of his view) that hyperacidity of this type is not, at its outset at least, purely functional. Apart from the fact that this single symptom is so often made a crucial test, there is little to criticise, and much to commend in this book. One very troublesome malady, however, receives too scanty notice, namely, mucous colitis, which is discussed as a variety of chronic constipation. The disease, however, presents so many special features, and is so rebellious to treatment, that a fuller account of it would have been helpful—in particular, some reference might have been made to von Noorden's plan of diet. With these reservations, we congratulate Dr. Cohnheim on having produced a useful, practical work.

NOTES ON BOOKS.

THE Lees and Raper Memorial Lectures were founded to commemorate two active workers in the temperance cause, and we have received from the Trustees copies of *The Effects of Alcohol on the Human Brain* (1900), and *Recent Researches on Alcohol* (1903). The fact that the first of these is by Sir Victor Horsley and the second by Professor Sims Woodhead is a guarantee that, although avowedly written from the temperance standpoint, the lectures are as dispassionate and free from unscientific bias as is possible in dealing with so thorny a subject as alcohol. Dr. Woodhead's lecture is a particularly valuable summary of the results of experimental physiological and pathological work on the action of alcohol, and though not every one will go so far as he in condemning the drug, we are sure that the teaching of modern physiology,—that alcohol is no stimulant in the sense which used to be supposed,—is steadily gaining ground, and that in consequence wine and whisky are not prescribed with the same freedom as even ten years ago. Sir Victor Horsley's lecture covers a less extensive field, being devoted exclusively to the effects of alcohol on the nervous system; his conclusions as to the damage done by even small doses are as uncompromising as those of Dr. Woodhead.

The subject-matter of Dr. Duncan Bulkley's *Relations of Diseases of the Skin to Internal Disorders* (Rebman Ltd., London) is sufficiently indicated by the title. Although doubtless the local treatment of skin diseases is of paramount importance, and in many cases is alone enough to give satisfaction both to patient and physician, still auxiliary dietetic, medicinal, and hygienic measures are never to be despised, lest we run the risk of treating the disease, not the patient. The first three lectures treat of the association of skin diseases with underlying constitutional states, while the fourth contains useful hints on the management of skin cases. Dr. Bulkley draws attention to a novel point in connection with the giving of milk as an adjuvant to ordinary diet. He holds that it should be taken during the period of the "alkaline tide"—just after the stomach has emptied itself of the previous meal—believing that it is then absorbed directly into the lacteals without previous digestion. Given at this time he asserts that it is invariably well borne.

Dr. Leslie Thorne Thorne's *Guide to the "Nauheim" Treatment of Chronic Diseases of the Heart* (Baillière, Tindall, & Cox, London) has reached a second edition, in which the author has given additional information on matters of detail, with the object of enabling those unacquainted with the method to administer both baths and the Schott exercises satisfactorily. A perusal of the book certainly justifies the author's hope that all who wish to practise the treatment may find all needful information in its pages, while even those who do not purpose making personal use of the Schott and Nauheim methods will after reading it be able intelligently to advise patients as to the propriety or otherwise of undergoing a "cure."

Dr. U. N. Mukerji's study of the metabolism of the natives of India in relation to dysentery—*Nutrition and Dysentery* (Kegan Paul, Trubner, Trench, & Co. Ltd., London)—is a painstaking piece of work, which reflects credit on the writer. His main contention is that slight alterations in diet (as in the case of prisoners in jails) lead to changes in the metabolism which lower the resistance of the body, and pave the way for the entrance of the *Amœba dysenteriæ*. The book merits the attention of all who contemplate practising among the natives of India. The effects of enforced abstinence from inunction of the body with oil, and from the very small amount of fish which forms part of the daily diet of the Bengali ryot, are remarkable, and whether or not Dr. Mukerji's opinions are correct can only be settled by further observations by those dwelling in the country.

Among journals devoted to the study of tuberculosis, *Beiträge z. Klinik der Tuberculose* (A. Stuber's Verlag, Wurzburg) takes a foremost place. The first part of the new volume (Bd. v.) is now before us, and contains among a number of other interesting papers an article on the Diazo-reaction in phthisis by Dr. Junker, and one on the treatment of tuberculosis by a new guaiacol compound named geosote. As its title indicates, the magazine is devoted mainly to the clinical aspects of the disease, so that both in this and in previous volumes, treatment, diagnosis, and pathology bulk more largely than the social and economic aspects of the tuberculosis question. The journal is well printed and attractively got up, and does credit both to the editor, Professor Brauer, and the publisher.

In view of the enormous popularity which artificial foods and proprietary remedies enjoy, it is not surprising that a second edition of Dr. Hutchison's *Patent Foods and Patent Medicines* (Bale, Sons & Danielsson, London) has been called for. This little pamphlet should be read by every one desiring an unbiassed verdict on these articles of commerce. We should like to see the lectures as well known to, and as widely read by, the laity as the medical profession.

In this little volume (*Organotherapy; or, Treatment by Means of Preparations of Various Organs.* London: Cassell & Co.) Dr. Batty Shaw presents us with a very clear description of the present position of organotherapy. The section on the thyroid and parathyroid glands is of necessity the longest. The various preparations of thyroid substance are described in detail, and it would seem from the number of diseases in which they have been tried that they are often used without any clear indications. The advantages of adrenalin in combination with cocaine for the production of local anæsthesia are clearly brought out. The use of adrenalin in cases of hæmoptysis is discussed, and good results are claimed for it, but, as is shown in the chapter on the actions of adrenalin that it produces congestion of the lungs, it is questionable if such treatment is without danger. It is perhaps rather unfortunate that the uses of the digestive ferments have not been more fully dealt with. The arrangement of the book is most convenient, and will commend itself to practitioners.

Although the six lectures on the "Nature, Variety, and Causes of Bodily Deformities" which go to make up the present volume—*Bodily Deformities*, by Chance, edited by Poland, vol. i. (Smith, Elder, & Co., London)—were written many years ago, at a time when comparatively little interest was taken in the subject by the profession in general, they are still well worth careful reading. Mr. Chance was a pioneer in the specialty to which he devoted himself. An immense amount of clinical material passed through his hands, and his lectures were the outcome of its careful study and thoughtful consideration. Additions to our knowledge of the subject from recent investigations since the author's death have been embodied in copious editorial notes by Mr. Poland, so that the volume as a whole gives a complete and up-to-date review of the subjects discussed.

In *Le Livre de la Sape Femme* Dr. de Seigneux has compiled a veritable vade-mecum for midwives. The book is primarlly a case-book containing a diary for obstetric engagements and sixty forms for notes on cases. These case-records are well arranged, and if, as Dr. de Seigneux advises, the nurse takes the book with her to cases, and makes immediate and accurate records, much valuable information would be obtained regarding the duration of pregnancy and the time occupied by the various stages of labour.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Acute Croupous Pneumonia.

Pathology and Treatment of Pneumonia.—Brem's paper (*Johns Hopkins Hosp. Bull.*, Baltimore, 1905, October) is a very important contribution to this subject, and though some of his conclusions are contrary to generally received ideas, the article will repay careful study. The line of argument is, first, to ascertain what the exact action of the toxic agent of pneumonia is—very much as if a new drug were being tested—and then to inquire how the results may best be combated. The action of the toxic agent he investigates by frequent observations on the temperature, the respiration, the pulse rate, and the systolic and diastolic blood pressures; for convenience, he divides it into *mild* and *severe*, according to the nature of the cases. *Mild action of the toxic agent.*—The acceleration of the respiratory rate is independent of pain and temperature (therefore due mainly to toxæmia), and is accompanied by increased action of the accessory muscles of respiration; the action of the toxic agent is thus that of a stimulant to the respiratory centre. The circulatory phenomena are acceleration of the pulse rate and high systolic blood pressure, also independent of temperature, etc., and therefore toxic. Here the action might be either a depression of the cardio-inhibitory centre, or increased irritability of the accelerator centre or heart muscle, or both. Probably it is a stimulant effect on the latter centre, overcoming any corresponding action on the cardio-inhibitory mechanism. With this there is increase of systolic blood pressure, without any great rise of diastolic pressure, *i.e.* large cardiac output. The mild action of the toxic agent possesses, then, all the features of a stimulation of the central nervous system and the heart muscle, evidence of which is found in central excitation, and in increased activity of the respiratory and circulatory mechanisms. *Intense action of the toxic agent.*—Probably in most cases the respiratory function is that most gravely affected, the ordinary phenomena of progressive asphyxia (respiratory insufficiency) occurring. Respiratory insufficiency may occur even under strong stimulation—even, that is, when the total quantity of air respired is much increased. Practically this is because the greater quantity of air is not utilised, on account of the respirations being shallow. The depth of the respiratory movements varies inversely with the rate, while the capacity of the bronchial tree remains constant. The tables and calculations on this point cannot be summarised further than to say that under stimulation of the respiratory centre, giving sixty respirations per minute, and a total respired volume of air of 12,000 c.c., instead of the normal 10,000 c.c., the volume of oxygen actually entering the alveoli diminishes by more than a half. With this state of matters there is a correspondingly diminished elimination of CO_2, which intensifies the stimulation of the respiratory centre, and sets up a vicious circle. The circulatory mechanism is, as a rule, less affected than the respiratory, but sometimes bears the brunt of the poisoning, or is affected simultaneously with the respiration, the falling systolic blood pressure, acceleration of the rate, and weakening of the heart being due to over-stimulation and over-work telling on the circulation. This results in lessened power of resistance, decreased urinary output and elimination of the toxic agent, and œdema of the lungs. If the circulatory condition remains good when respiratory insufficiency is established, the systolic blood pressure rises from asphyxial stimulation of the vaso-constrictor centre. Systolic blood pressure may therefore be either high or low when the patient is critically ill, and hence by itself is of little prognostic value; it must be considered along with the respiration. The phenomena of the severe action of the toxic agent are therefore expressions of intensified stimulation, which aggravates the condition of increased functional activity, and tends to induce over-work and exhaustion. The main causes of death are—(1) Respiratory insufficiency, terminating in asphyxiation, or in exhaustion of the respiratory centre; and (2) circulatory insufficiency, leading to accumulation of the toxic agent, and ending in œdema of the lungs and exhaustion of the heart muscle.

THERAPEUTICS.—*Elimination.*—The most efficient means of eliminating the toxic agent is by internal hydrotherapy. The effort is made to send through the circulation the largest quantity of fluid possible, in the hope that as it is passed out by the kidneys the toxic agent will also be excreted. If there is a soluble toxin, this is a reasonable hope; for during the acute illness the albumin molecule, a normal constituent of the blood, almost constantly passes out by the kidneys. In mild cases of pneumonia there is an increase in the urinary output during the twenty-four hours preceding the crisis. A remarkable instance of early crisis coincident with copious water-drinking is quoted. Digitalis also assists elimination by its diuretic action. *Respiration.*—The indication is to counteract respiratory stimulation, while at the same time increasing the depth of the respirations. (*a*) *Heroin*, in animals, reduces the respiratory rate from 30 to 50 per cent., while the depth of each respiration is greatly augmented; it also relieves cough and pain, and procures sleep. In doses of $\frac{1}{24}$ to $\frac{1}{12}$ gr. hypodermically, it was found to have this action in two cases; but in another it also produced an alarming irregularity of the pulse, which, however, was only temporary. The action was probably one on the heart muscle, as the drug is believed to have no depressant effect on the cardio-vascular centres. (*b*) *Morphine* has less action on the respiration than heroin; it slows the normal movements, but does not increase their depth sufficiently to prevent a diminution of the total air respired. If, however, the respirations are insufficient, they may be deepened enough to increase the air entering the lung. Brem takes forty respirations per minute as the danger line, and advises heroin or morphine in small doses every two hours for a respiration rate of 36 or more, so as to prevent, if possible, the rate rising above that number. Careful note should be made of the depth of the respirations, as gauged by the abdominal movements. (*c*) *Oxygen.* —Inhalation of oxygen is, in Brem's opinion, useless. It only temporarily relieves respiratory insufficiency, and irritates the already inflamed air passages. [The arguments adduced on this point do not seem very conclusive, and the author's experience that continuous inhalation produces discomfort is not the common one.] *Circulation.*—The circulatory condition is favourably influenced by measures adapted to meet general and respiratory indications, on which chief reliance is to be placed. Agents used for their direct action on the circulation are sedatives, alcohol, and stimulants. (*a*) *Sedatives.*—The chief circulatory sedatives are aconite, veratrin, and hydrocyanic acid (all of which are, for various reasons, contra-indicated); but nitrites might be used to lessen the work of the heart. (*b*) *Alcohol.*—In alcoholic cases it seems reasonable to give, in moderation, a drug to which the tissues are habituated. In other cases, Brem has never seen results, either good or bad, that he could attribute directly to it. Probably its administration lessens cardiac work and nervous irritability, and is of benefit during the stages of excitement. When enfeeblement of the respiratory or circulatory mechanisms has begun, it is probably contra-indicated. (*c*) *Stimulants.* —These are needed only when circulatory insufficiency, indicated by low systolic blood pressure, accompanied by small urinary output, respiratory insufficiency, or œdema of the lungs, is present. A remedy should be used which has no deleterious effect on the nervous system, stimulation of which, especially the respiratory centre, is to be avoided. Now strychnine, caffeine, and cocaine owe their action on the circulation to stimulation of the nervous system; but digitalis has practically no effect on the medulla, save on the cardio-inhibitory or vaso-constrictor centres. The tincture gave the best results as regards blood pressure and urinary output. The fourth indication in treating pneumonia is to *ameliorate harmful influences*,—fever by cold, pain by an ice bag, and analgesics, restlessness, insomnia, and delirium by external hydrotherapy, analgesics, and narcotics. The article contains a number of charts, showing the details of Dr. Brem's observations. Though the author's conclusions as to treatment—which may be summed up as the administration of heroin or morphine two-hourly when the respirations are over 36, and digitalis only when a circulatory insufficiency is declared, while oxygen is useless, alcohol possibly beneficial only when there is no heart failure, and strychnine positively harmful—are doubtless open to argument, his paper is full of suggestion and interest.

Etiology of Pneumonia.—After pointing out that two organisms at least—Fränkel's diplococcus and Friedländer's bacillus—may cause pneumonia, Schottmuller (*München. med. Wchnschr.*, 1905, July 25) describes a third organism, which he first isolated from parametritic pus, and subsequently obtained in pure culture from the blood and sputum (during life) and the viscera of a series of cases of pneumonia. This organism he has named the *Streptococcus mucosus*, because there is always an excessive production of mucus in the lesions of causes. The cultural characteristics of the organism (for which the original must be referred to) are constant and distinctive. The mortality of the cases in which the *Streptococcus mucosus* was found was high—90 per cent.

Acute Pericarditis in Lobar Pneumonia.—Chatard (*Johns Hopkins Hosp. Bull.*, Baltimore, 1905, October) has analysed 665 cases of pneumonia, occurring during a period of sixteen years, with reference to the incidence of acute pericarditis, which was present in thirty-one patients, or 4·6 per cent. The chief points which emerge from his investigations are as follows:—The complication is most common in young adults (average age, 32·5 years). It was recognised during life in less than half the cases (42 per cent.). Pleurisy is an almost invariable accompaniment. The mortality was 93·5 per cent. The varieties in order of frequency were—Fibrino-purulent, ten; sero-fibrinous, nine; fibrinous, eight; purulent, two. A large effusion was met with only thrice. Acute pericarditis is least common in left-sided pneumonia—four cases only—which seems to show that it is due to a metastatic process through the blood or lymphatics rather than to direct extension from lung or pleura. The paper terminates with a review of the literature.

"One-Day" Pneumonia.—Abortive pneumonia is the subject of a paper by Bechtold (*München. med. Wchnschr.*, 1905, October 31), who gives abbreviated case records of a series of cases of pneumonia in which the crisis occurred on the second day. The only symptoms common to all were rigor, fever, and critical sweating. The signs varied greatly in different cases: percussion gave a clear, tympanitic, or dull note, auscultation, vesicular or tubular breathing, crepitations or bronchophony. The sputum was seldom rusty. Pneumonia is most likely to abort in robust individuals. There is some ground for supposing that, as in other infections, these mild "one-day" cases are most common when the graver forms of the disease are epidemic. It is also probable that some are due to an infection of low virulence, as cases tend to occur in series apart from a bad type of pneumonia.

A New Serum Treatment of Croupous Pneumonia.—Tauber (*Wien. klin. Wchnschr.*, 1906, March 10) has employed Römer's pneumococcus serum, which was introduced for treating ulcer of the cornea, in acute pneumonia. It is a polyvalent bactericidal serum, and is given in doses of 10, 20, and 30 c.c., by intramuscular injection. Fourteen severe cases were treated; of these nine were purely diplococcal, Friedländer's bacillus or some other organism being present in the rest. Only the diplococcus pneumonias were influenced by the serum. Details are given of these cases, all of which recovered; but it is extremely difficult to judge in how far the treatment played any part in the result. In Case 1 the injections were made on the eighth and ninth days; the crisis occurred on the tenth. Case 2.—Injections on third, fourth, and fifth days; crisis, fifth. Case 3.—Injection on fifth day; crisis on sixth. Case 4.—Injection on fourteenth day; crisis on fifteenth.

Case 5.—Injections on seventh, eighth, and ninth days; crisis on tenth. Case 6.—Injections on fourth, fifth, and sixth days; crisis on seventh. Case 7.—Injection on eighth day; crisis, ninth. Case 8.—Injections, seventh and eighth days; crisis, ninth. Case 9.—Injections, fourth, fifth, sixth, ninth days; crisis, eleventh. All seem to have been severe cases, and therefore the recovery rate is extremely good; but there is nothing to show that the natural course of the malady was in any way shortened by the use of the serum.

SURGERY.

UNDER THE CHARGE OF

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On the Sensibility of Different Organs and Tissues.

The observations of Lennander of Upsala on the sensibility of the abdominal viscera and peritoneum are already well known. In the paper before us (*Gaz. d. hôp.*, Paris, 1906, April 3 and 5) he has amplified these, and added the results of additional experiments on the sensibility of other organs and tissues. He begins by enunciating the general law that "all organs innervated solely by the sympathetic nerves or by the vagus (beyond its recurrent branch) are devoid of four forms of sensibility, namely, to pain, to pressure, to heat, and to cold. All the sensations usually assigned to them have their seat or the origin in the nerves of the parietal subserous tissue." The recognition of this general law has greatly influenced the author in the direction of operating under local anæsthesia for such conditions as hernia, the extraperitoneal tissues being rendered insensitive with cocaine or by freezing. In prolonged operations inside the abdominal cavity, he withholds the general anæsthetic during the period that the viscera are being dealt with, only administering it for the preliminary incision and for the closure of the wound. The strength of the cocaine he uses varies from 1 in 200 to 1 in 800, with a distinct preference for the weaker solutions. About 2 drops of adrenalin solution is added to 10 c.c. of the cocaine solution. In the course of operating on the limbs, Lennander has made the interesting observation that intra-neural injections into the great sciatic nerve are painful if the limb is extended, but if the knee is flexed so as to relax the nerve, they are unattended with pain.

Referring to the sensibility of the different organs, he confirms the fact that both the grey and the white matter of the *brain*, whether in a normal or in a pathological condition, are totally devoid of sensation to ordinary handling, to contact with the thermo-cautery, or to the Faradic current. In two cases he has found that the dura mater in the mastoid region is similarly insensitive.

Stomach.—Lennander has already shown that the anterior and posterior surfaces of the stomach in the region of the greater curvature are insensitive. He now adds the statement, based on a new observation, that the cardiac end of the stomach is similarly devoid of sensation when submitted to all the manipulations involved in resecting a portion of it. There is pain, however, when the viscus is stitched to the *parietal* peritoneum.

The ileo-cæcal valve.—The author refers to the observation of Treves and Keith, that while the left iliac fossa is devoid of sensation to pressure, in the right iliac fossa, at a point a little above and to the inner side of McBurney's point, deep pressure elicits distinct pain. Treves and Keith believed that this sensation was elicited by pressing over the ileo-cæcal valve, which on dissection they found to lie immediately under the tender area. Lennander has tested the sensation of the ileo-cæcal valve in the living subject, and has found that it, like the rest of the intestine, is totally devoid of sensation. In his opinion, the facts observed by Treves and Keith are susceptible of another explanation. He has noticed that it all depends on how the right iliac fossa is palpated whether or not it is sensitive. Simple direct pressure over the part does not cause pain in a healthy person; but if the pressure be made in such a way as to involve displacement of the viscera, or dragging on them, then there is pain, and this Lennander attributes to traction on the subserous nerves of the parietal peritoneum. In this connection he refers to the so-called "McBurney's point," which he believes corresponds to that part of the posterior abdominal wall where, under normal conditions, the lymphatics involved in appendicitis first come into relation with the sensitive nerves of the retro-peritoneal subserous tissue. The first lymphatic glands of the appendix also lie in the angle between the ileum and the colon, and are therefore subject to pressure.

Kidney and pelvis of kidney.—The parenchyma of the kidney is insensitive to all forms of contact, even, for example, to puncture with a large trocar. The mucous membrane of the renal pelvis, on the other hand, was found to be extremely sensitive to touch or traction, or even to slight over-distension with fluid injected into it, the pain shooting along the line of the ureter, and sometimes into the urethra.

Vagina.—The wall of the vagina is not sensitive to incision, to pinching with artery forceps, to the contact of the thermo-cautery, or of the electrodes of a Faradic pile. If the electrodes are brought near to the vulva, however, in front of or to the sides of the urethra, the electric current is acutely felt. If an incision be carried through the vagina into the bladder, the patient suffers. The conclusion drawn is that the perivesical tissue is undoubtedly sensitive to pain.

Bones and joints.—Lennander makes the general statement that "the periosteum and the capsular ligaments of joints are provided with nerves sensitive to pain, but the bone, the medulla, and the articular and epiphysial cartilage do not possess nerves of this kind." In proof of this, he cites various observations made on the skull, the mastoid process, and on long bones the seat of sequestra and of abscess. His observations show also that the synovial membrane is sensitive.

Observations made on the knee-joint during amputation, the soft tissues having been rendered anæsthetic by cocaine, showed that the synovial membrane is highly sensitive, but that the articulate cartilage is devoid of sensibility to pain, to pressure, to heat and cold, to stimulation by Faradic electricity, to the thermo-cautery, to the action of strong mineral acids, and to the various manipulations involved in an operation. The sawing of the bone even was not attended with pain. An observation made by Helling on a joint which had been accidentally opened is quoted. The condyles of the femur and tibia, and the semilunar cartilage, were insensitive to touch, to pressure, or to heat. A slight twisting of the meniscus towards the interior of the joint, however, was attended with acute pain. The synovial membrane also was found to be sensitive to pressure, traction, and pinching. The experiences of a student who submitted to amputation of the leg above the knee, practically without anæsthesia, go to confirm the previous observations. They furnish interesting reading, but are too long to be quoted here.

Certain clinical deductions are drawn from these observations. An inflammation confined to the spongy bone, while associated with general evidence of toxin absorption, is not accompanied by pain, but when the hyperæmia reaches the periosteum the condition becomes acutely painful, especially if the exudate strips the periosteum from the bone. The occurrence, therefore, of general symptoms—lassitude, rigors, fever, sweating—for some days before the onset of local pain, suggests the presence of suppuration in the interior of the bone; and inversely, the onset of pain, before or coincidently with general symptoms, indicates the presence of suppurative periostitis. When a joint is moved beyond its physiological range, the pain elicited is due, not to compression or jarring of the cartilages or bones, but to squeezing of the synovial membrane, or to traction on the ligaments or the periosteum in relation to which the ligaments are attached. The pains of flat foot, knock-knee, scoliosis, etc., are to be explained on similar lines.

In destructive joint lesions, also, such as tubercle, for example, the occurrence of pain is indicative of involvement of the synovial membrane, the ligaments, or the periosteum.

The author sums up this suggestive paper by saying that the body is enclosed in an envelope—the skin—which reacts almost everywhere to pain, pressure, heat and cold, although its reaction is of unequal intensity at different points. The sensibility of the muscles and aponeuroses is comparatively less acute. The parietal pleura, the parietal peritoneum and their subserous layers, the periosteum and the synovial membranes of joints, all possess marked sensibility to pain, but they do not react to pressure, heat and cold. The most painful manœuvres are dragging movements, lacerations, pressure of serous cavities or periosteum against resistant structures, such as aponeuroses, ligaments, or bones.

On the other hand, bone, cartilage, the brain, the lungs, the heart, the blood vessels (when denuded of the surrounding connective tissue). the thyroid gland, the liver, the spleen, the pancreas, the renal parenchyma, the internal genital organs of the female, the parts of the testis covered by serous membrane, do not appear to possess any of the four forms of sensibility. The author thinks this is less absolutely proved regarding the stomach, the intestinal canal, and the gall bladder. The opinion that these organs become painful when in a pathological condition, *e.g.* when inflamed, he considers untenable.

THE DANGERS OF SCOPOLAMINE ANÆSTHESIA.

WHITACRE of Cincinnati (*N.Y. Med. Journ.*, 1906, March 31) reviews the recorded cases in which death has been attributed to scopolamine administered in combination with morphine and chloroform or ether as an anæsthetic. In a certain number of the cases there seems good reason to believe that the fatal result should be attributed to other factors than the scopolamine. At the same time, the author concludes that scopolamine-morphine narcosis is not devoid of danger, and that the use of this combination alone for surgical narcosis is neither justifiable nor practicable. A single dose two hours before operation lessens the discomforts attendant upon the operative procedure, and may obtain a definite place in surgical practice. Four deaths which may be fairly attributed to scopolamine have occurred in a series of 2400 cases, the clinical features being those of alkaloid poisoning, and the direct cause of death has been heart failure. Fatty degeneration of the liver and kidneys has been produced by the use of repeated doses of scopolamine alone, and of scopolamine in combination with morphine in animals. The method cannot yet be recommended for use in general practice.

CARCINOMA OF THE PROSTATE.

HUGH H. YOUNG of Baltimore (*Journ. Am. Med. Ass.*, 1906, March 10) reports the results of a study of fifty cases of carcinoma of the prostate, from the point of view of the possibility of performing a radical cure by operation. The cancer may begin as a small indurated nodule in one or both lobes of an otherwise benign hypertrophy, and it remains confined for a long time within the capsule of the prostate. Its line of invasion is upward along the course of the vasa deferentia and seminal vesicles, and not usually into the bladder around the prostatic orifice. The inferior surface of the trigone is usually the first portion of the bladder to become involved. It is thus evident that if a radical cure is to be attempted, the line of incision must include the entire prostate, with its capsule and urethra, the adjacent portion of the bladder, particularly of the trigone, the seminal vesicles, and the ampullæ of the vasa deferentia.

The early diagnosis is not easy. The first symptoms are those of ordinary benign prostatic hypertrophy, but a dull, suprapubic pain, which is worst when the bladder is full, is usually a marked feature. When present, pain in the rectum and lower extremities is a very suspicious symptom, and should strongly suggest malignancy. Hæmaturia is not a prominent symptom. The progress is more rapid than in simple hypertrophy, and there is an early large residual urine. There is usually marked loss of weight. An unusual thickness of the retro-urethral portion of the prostate, as shown by an instrument in the bladder and a finger in the rectum, is nearly always present. A remarkable characteristic of cancer of the prostate is that metastases directly to the osseous system occur more often than in the glands. The author describes the operation, which he performs by the perineal route. He has operated on six patients with one operative death.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF
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Pernicious Vomiting of Pregnancy.

Williams (*Johns Hopkins Hosp. Bull.*, Baltimore, 1906, March) classifies this condition into three forms,—Reflex, Neurotic, Toxæmic,—each requiring different treatment. The first variety may be due to uterine conditions, ovarian tumours, hydramnios, or twins. The second form is frequent, and constituted the majority of cases according to Kaltenbach. The toxæmic variety may have its origin in the gastro-intestinal tract, ovum and its appendages, or the liver. In many such cases there is noted a great disturbance of metabolism, shown by decrease in amount of nitrogen excreted as urea, and increase of the ammonia coefficient. What the nature and origin (fœtal or maternal) of the toxin may be is unknown. Before treating a case, careful pelvic examination should be made, to discover any source of reflex vomiting, and a careful examination of the urine made, in order to ascertain the ammonia coefficient. In non-toxæmic vomiting, this latter amounts to about 5 per cent., as contrasted with 30 to 40 per cent. in cases of vomiting of toxæmic origin. Williams thinks an increase to about 10 per cent. would justify the termination of pregnancy. High temperature and quick pulse are not always present, even in bad cases. The prognosis is good in the neurotic and reflex forms, bad in the toxæmic, unless pregnancy is quickly terminated. In the neurotic form, rectal feeding and small doses of morphine are recommended; in the reflex form, displacements, ovarian tumours, and the removal of other pelvic causes; and in the toxæmic form, early abortion, followed by saline injections (rectal and subcutaneous), are indicated. If the vomiting persists, Williams recommends washing out the stomach with a weak solution of sodium bicarbonate.

Lactation and Menstruation.

Heil (*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, 1906, March) noted that of 200 nursing women pregnancy took place in twenty-four = 12 per cent. Of those, seventeen had menstruated during lactation, while only in seven had menstruation been absent. Heil further finds that about half only of nursing women have absolute amenorrhœa. Menstruation during lactation does not indicate weaning. The longer suckling is continued after the fourth month the greater the chance of menstruation returning.

VILLOUS TUMOURS OF THE FALLOPIAN TUBES.

TÉDENAT (*Arch. Prov. de chir.*, 1906, No. 3) reports three cases—(1) Papilloma of both tubes; (2) villous tumour of right tube with papillary cyst of corresponding ovary; (3) villous growth of both tubes. Those growths present the form in some cases of adeno-papilloma, in others of adeno-carcinoma. Most cases are diagnosed as pyosalpinx previous to removal by cœliotomy. The only satisfactory treatment is abdominal hysterectomy, with as wide a dissection as possible of the parametric tissues. By this treatment the author has obtained good results in two cases, the patients being free of any relapse five and nine years after operation. In cases of malignant growth the prognosis is very unfavourable, even after an extensive abdominal dissection.

SIMULTANEOUS EXTRA- AND INTRA-UTERINE PREGNANCY.

WEIBEL (*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, Bd. xxii. Heft 6) in this paper gives a very complete epitome of all published cases of this combination. Under the heading of etiology, Weibel gives diagrams showing that external migration of the ovum across the peritoneal cavity is necessary before it can enter the opposite tube. He describes a case where pregnancy had advanced to about two months, ending in abortion of the uterine pregnancy, and rupture with formation of hæmatocele in the tubal pregnancy. The uterine abortion occurred previous to the operation for the hæmatocele.

PUERPERAL GANGRENE OF UPPER EXTREMITIES.

FRÄNKEL (*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, Bd. xxii. Heft 6) describes the following case:—P., æt. 24, primipara, had normal confinement. Twenty-four hours later symptoms of sepsis manifested themselves. Every known remedy for general puerperal septicæmia was tried without benefit. On the twelfth day no pulse could be detected anywhere in the left arm. This was followed by a similar condition in the right arm, gangrene appearing in both. Death occurred on the fifteenth day. There was thus complete absence of symptoms till gangrene commenced simultaneously with the development of cardiac murmurs. No post-mortem was obtained to clear up the possible causation.

PROPHYLACTIC AND THERAPEUTIC VALUE OF ANTI-STREPTOCOCCUS SERUM.

FROMME (*München. med. Wchnschr.*, 1906, January 2) has had good results in early streptococcus infections, endometritis, and post-operative peritonitis. Injections are of no value in pyæmia and septicæmia. Under prophylactic injections the author includes three cases of salpingo-oophorectomy, with peritubal hæmatocele, two of total extirpation of the uterus for myomata, and two vaginal hysterotomies. In all cases cure resulted without rise of temperature or pulse rate. They were all injected with 10 c.c. of Menzer's serum four hours before operation. In six cases of streptococcic endometritis the best results were obtained. A commencing infection, with fever, had set in, the latter coming down at once, and the infection terminating.

EXTRA-UTERINE PREGNANCY.

NOBLE (*N.Y. Med. Journ.*, 1905, December) reviews his experience of this condition. In sixteen years he has operated on ninety-one cases—eighty-nine abdominal cœliotomies and four vaginal sections—two of the latter, however, requiring subsequent abdominal section. One tube was involved about as often as the other. In twenty of the cases the opposite tube was inflamed (salpingitis, hydrosalpinx, and hæmatosalpinx), but in no case was there coexisting pyosalpinx. Noble is of opinion that the cause of ectopic gestation is in most cases a mechanical one. Seven of the total are reported as unruptured, fourteen ruptured, and seventy tubal abortions. With regard to the ruptured cases, Noble's experience shows that the danger from hæmorrhage increases in the ratio as the point of rupture approaches the uterine end of the tube. In two cases where the rupture was near the uterine end, death occurred before Noble had time to operate. Of the fourteen ruptured cases six died; of the seventy tubal abortions four died. The author limits vaginal section to suppurating hæmatoceles, and concludes his paper as follows:—(1) A correct and early diagnosis can usually be made if the history of the patient be carefully elicited. The diagnosis depends as much on the history as on the physical examination. (2) If early diagnosis is made, the patients can be operated on while still in good condition, with the result of securing a high percentage of recoveries. Deaths from ectopic gestation are usually due to hæmorrhage so sudden and profuse that operation is impossible, or failure in diagnosis, with resulting delay in resorting to operation.

A CASE OF UTERINE TUBERCULOSIS.

BRAUN (Fernwald, *Wien. klin. Wchnschr.*, 1906, No. 1) reports the case of a sterile but otherwise apparently healthy woman, who had irregular attacks of uterine hæmorrhage, treated by curetting. Microscopic examination showed the condition to be a commencing tuberculosis, the mucosa exhibiting several small nodules, with Langhan's giant cells. The curetting apparently cured the patient, as there was no further evidence of tuberculosis at the time the case was published.

THERAPEUTICS.

UNDER THE CHARGE OF
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Influence of Certain Antipyretics on the Nitrogen Metabolism.

Morgenbesser utilised a standard diet consisting approximately, during each twenty-four hours, of 500 c.c. milk, 200 c.c. cream, 450 grms. eggs, and 20 grms. sugar, with water *ad lib.* This is a purin-free diet, and does away with exogenous uric acid, and any uric acid excreted represents only uric acid formed in the body. The experiments were carried out on the author himself during a continuous period of twenty-one days, which was divided into seven periods of three days each, allowing a free period of three days between each drug. By this plan any late action of the drug was shown. The drugs investigated were salicylate of sodium, quinine, and acetanilide, and the results obtained were as follows:—Sodium salicylate increases the total output of nitrogen and increases the urea, but the uric acid and xanthin bases are not increased. The ammonia output seems to be much increased. The increase of the total nitrogen begins at once, but ceases on stopping the drug. Quinine decreases the total nitrogen, the total urea, uric acid, and purin bases, but slightly increases the output of ammonia. The decrease in total nitrogen stops as soon as the drug is discontinued, but is followed by an increased output in nitrogenous constituents. Acetanilide increases the total nitrogen, urea, uric acid, and ammonia. On stopping the drug there is a decrease in the output of total nitrogen.—*N. Y. Med. Journ.*, 1906, April 14.

Röntgen Rays in Exophthalmic Goitre.

Pfahler and Thrush report a case in a woman which was greatly improved under ten minute exposures thrice weekly. She had in all twenty-two treatments, and gained 25 lb. in weight, while the pulse rate fell from 120 to 72. During the ray treatment the patient received general tonic treatment with iodine, nitroglycerin, strophanthus, and a sedative pill, but the authors are convinced that the improvement was due to the X-rays.—*Therap. Gaz.*, Detroit, 1906, March.

Proponal a New Hypnotic.

Proponal was investigated by Fischer and Mering some years ago, but the hypnotic results were not very satisfactory, and they preferred veronal, a diæthyl combination, to proponal, a dipropyl combination.

More recent investigations (*Pharm. Post*, 1906, No. 1) show that the proponal experimented with was not a pure substance, and that the pure preparation gives a reliable hypnotic action in doses of 0·15 to 0·5 grm. Like veronal, proponal is a colourless crystalline substance. The taste is slightly bitter but not unpleasant.

Mörchen has tested the hypnotic action in a number of asylum patients, and comes to the following conclusion:—Proponal is a good hypnotic, closely resembling veronal in its action. It requires a somewhat smaller dosage, but acts promptly and without any unpleasant side action. A disadvantage lies in the fact that there appears to be a somewhat more restricted range within which it is possible to push the drug. The normal dose from his experiments should not exceed 0·5 grm. (7½ grs.), whereas veronal can be given with safety up to 1 grm. or even 1·25 grm. Thus the dosage of proponal should be roughly only half that of veronal, but the hypnotic action is not more intense than that of veronal. After a suitable dose of proponal, the patient in about half an hour commences to feel sleepy, and then falls asleep without any mental confusion. The sleep lasts for some hours. With repeated administration the action of the drug rapidly diminishes, and this weakened action is seen after three or four nights' use, but if another hypnotic be given for a couple of nights the patient again reacts well to proponal. In two instances where proponal was administered to patients whose mental faculties were seriously impaired, the hypnotic action was not obtained, but instead it caused a transient excitement stage with terrifying dreams, which was followed with distinct bodily and mental depression. Probably the chief indication for the new drug will be that of temporarily replacing veronal when the patient is becoming accustomed to the effect of the latter drug.—*München. med. Wchnschr.*, 1906, No. 16.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF

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Barberio's Test for Semen.

Cevidalli has subjected the test for seminal fluid recently suggested by Barberio (*Edin. Med. Journ.*, 1906, February, p. 179) to further investigation. Cevidalli fully corroborates its reliability. He suggests, however, a slight improvement in the reagent, namely, that instead of using a saturated watery solution of picric acid, a glycerin alcohol solution should be employed. This is prepared by dissolving with the aid of heat first so much picric acid as results in a slight precipitation of crystals on allowing the solution to cool. The clear solution is decanted. and to it a small quantity of absolute alcohol is added, and the whole thoroughly mixed. He claims for this modification of Barberio's reagent the following advantages:—(1) It prevents the precipitation of picric acid crystals in the specimen under examination, which interfere with the clearness of the reaction. (2) It permits the preservation of specimens in which the reaction has been obtained, for long periods. (3) It tends to clear the microscope field of view as regards the general results obtained with Barberio's or his own modification of the reagent. Cevidalli finds that it gives uniformly positive results with human semen, and proved entirely negative when used with extracts of various organs (liver, brain, spleen, kidney), in addition to those secretions tested by Barberio. It was found also to be specific to human semen, at least so far as the seminal fluid of the horse, dog, and pig is concerned. A point of interest is, further, that Barberio's reaction does not interfere with that of Florence, a point of some importance when the material for examination is limited in quantity, since, after using one test, the other may be employed on the same specimen with satisfactory results. Lastly, as to the substance upon which the reaction depends. In the case of Florence's reaction, this has been proved to be cholin, and Cevidalli shows that Barberio's reaction is not due to the same substance, and agrees with Barberio that it probably arises from the presence of protamin in the semen.—*Vrtljschr. f. gerichtl. Med.*, Berlin, Bd. xxxi. Heft 1.

The Forensic Differentiation of Blood by means of Anti-Hæmolysins.

A further contribution by Neisser and Sachs is made (*Berl. klin. Wchnschr.*, 1906, No. 3) upon this subject in continuation of their article which appeared in the same journal (1905, No. 44), and which was based upon the investigations of Gengou and Moreschi. The authors recommend that their method of blood diagnosis should be used in forensic cases in conjunction with that of Wassermann-Uhlenhuth. It depends upon the properties of anti-hæmolysins. Instead of employing, as they at first suggested, allied immune sera, the authors now make use of the hæmolytic action of normal serum in order to produce the desired reaction. Their method is thus simplified. They make use of the hæmolysin for sheep's blood which is present in normal rabbit serum.

A preliminary experiment is first made, to determine the amount of rabbit serum necessary to effect complete solution. The quantity of rabbit serum thus found was then mixed with the fluid to be tested for human blood and with 0·01 c.c. of anti-serum. The anti-serum was obtained from rabbits in the usual way.

The above mixture was then allowed to remain for one hour at 37° C., after which 1 c.c. of a 5 per cent. sheep's-blood solution was added, and the mixture kept for two hours at 37° C. The absence of hæmolysis indicates the presence of human blood. A control experiment must, of course, be performed, leaving out the solution of suspected human blood and resulting in hæmolysis. The test is exceedingly delicate. $\frac{1}{100000}$ c.c. of human blood serum entirely prevents hæmolysis under the above conditions, and even the presence of $\frac{1}{1000000}$ to $\frac{1}{10000000}$ c.c. of human blood can be recognised by marked effects in the reaction.

Revolver Wound of the Anus.

The following case is of great medico-legal interest, owing to the situation of the wound and the difficulty which arose in deciding whether it was a case of suicide or murder. A young man, æt. 23, lived with his father and a lodger in a cottage. He was of weak intellect but of a cheerful disposition, and earned a few coppers by doing odd jobs and by street singing.

One day, not being very well, he stayed at home, and when his father returned from work at 5 p.m., the latter found the door of the cottage half-open and the body of his son lying dead upon the sole couch of the apartment. The body was quite naked, and the deceased's shirt, stained with blood, was lying on the ground near the door. There were blood stains upon the coverings of the bed, and on a table 5 ft. distant from the body lay a revolver belonging to the father. Two cartridges in the revolver had apparently missed fire, but a third one had been discharged and was empty.

The examination of the body disclosed a wound situated to the right of the anus and immediately adjoining it. Its edges were blackened and irregular, and it was about the size of a franc piece. This wound and the anus formed practically one opening. The mucous membrane of the uninjured margin of the anus was split longitudinally in parts, as if it had been hyper-distended.

There was blood upon the buttocks, scrotum, penis, inner surfaces of the thighs, and upon the hands. On both buttocks, about 2 in. from the anus, there was a patch of parchment-like skin in which grains of unconsumed powder were embedded. The skin around the anus was also blackened by the smoke of the discharge. The projectile in its course had passed successively through the rectum, the bladder in two places, the left common iliac artery, the small intestine producing twelve perforations, the transverse colon, the diaphragm, the base of the left lung, until it was finally arrested by the seventh left rib, which was partially fractured a little anteriorly to the axillary line.

The bullet weighed 8 grms., and fitted the revolver found in the cottage.

Inquiries made showed that the deceased was not known to be given to pæderasty, and no spermatozoa were found on microscopic examination of the contents of the rectum. Barbaran and Parisot, who report the case, discuss the question of accident, suicide, or murder, which naturally arose in consequence of the unusual situation of the wound and the other suspicious circumstances.

Apart from the wound above described, the body presented no marks of violence, and the conclusion come to was that an accident was inadmissible, while suicide appeared improbable, although its possibility had to be admitted. Murder seemed to them the most likely explanation.—*Rev. de méd. légale*, 1906, March.

Rupture of the Vagina during Coitus.

Likmund (*Wien. klin. Wchnschr.*, 1906, No. 4) discusses the causes, anatomical position, and statistics of injuries to the female during the act of sexual connection, and records a very interesting case from his own practice. He was called one night by a young man to come and see a woman with whom he kept company, and who during the act of connection suddenly complained of great pain in the vagina. Violent bleeding ensued, and when Likmund arrived he found the patient to be a powerfully built and well-nourished woman, æt. 22, who was very anæmic from the loss of blood, which still continued. In the right side of the vagina there was a longitudinal, gaping, lacerated wound $2\frac{1}{3}$ in. in length, which commenced 1 in. below the portio vaginæ. The couple stated that the injury occurred during perfectly normal connection, and that they had frequently performed the act on previous occasions. The examination of the woman disclosed nothing to account for the accident. The vagina was long and wide, there was no retroflexion or other displacement of the uterus. The patient had given birth to a child two years before, but no cicatrix or other predisposing cause of rupture was present.

The case is interesting on account of the site of the rupture, only two other cases of laceration of the right side of the vagina having been recorded as a result of coitus.

The Value of Alcohol in Carbolic Acid Poisoning.

Clarke and Brown (*Journ. Am. Med. Assoc.*, 1906, March 17) report the results of an exhaustive experimental and clinical study on the value of alcohol as a method of treatment in cases of poisoning by carbolic acid. From the clinical aspect, it appears that alcohol has a local antagonism to carbolic acid. When the latter is taken in whisky the feeling of discomfort is less marked, and the local eschar is absent or but slightly evident. In cases of poisoning, lavage with alcohol is apparently an effective mode of treatment. This is borne out by a comparison of thirteen cases (reported in the article) with a mortality of 15 per cent., with the collection made by Falck in 1868 of forty-six cases in which the acid was taken internally, with thirty-five deaths, a mortality of 65 per cent. The authors admit, however, that fourteen cases treated at Lakeside Hospital by lavage prior to the use of alcohol, with three deaths, a mortality of 21 per cent., give results so nearly akin to their alcohol cases that it would appear that the lavage was the dominant factor rather than the alcohol. The authors, however, while admitting that the superiority of lavage with alcohol over lavage with water is not pronounced, do not wish to be interpreted as considering that alcohol is of no value in cases of carbolic acid poisoning. They regard it as a result of their clinical experience as an aid when properly used in the saving of life. They recommend immediate and abundant lavage with 10 per cent. alcohol, this to be followed by lavage with plain water and general stimulation of the patient. They further recommend the necessity of care in the method of performing lavage in this class of cases, owing to the great danger of some of the gastric contents regurgitating around the outside of the tube. It is easy for such matters to enter the larynx, and thus to give rise to pneumonia.

DISEASES OF THE EYE.

UNDER THE CHARGE OF
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The Condition of the Eyes at Parturition and during the Puerperium.

Pregnancy and parturition are physiological processes, and while it is true that occasionally they are attended by pathological conditions of the eye (with which alone we are at the present time concerned), it is natural that this should only very rarely be the case. Bosse (Königsberg), however, published an article recently, in which he asserted that distinct alterations were present in the majority of pregnant women. He examined 124 women at the close of pregnancy, and 300 after parturition, and in 75 per cent. of the pregnant women he found decided changes, appearances resembling neuritis, but without subjective symptoms, reddening of the papilla, blurring of its margins, and moderate swelling with parallactic movements, tortuosity and kinking of veins, but only once a small hæmorrhage. These changes disappeared rapidly after parturition—so rapidly that while on the first day only one-eighth of the 300 patients presented a normal fundus, on the second one-fourth, and on the eleventh two-thirds. did so; on the fifteenth all were normal.

To obtain confirmation of these results, or the reverse, Polte (Halle) examined the fundus in 200 women in the puerperium, in 177 of whom he was also able to use the ophthalmoscope before child-birth. Of the 200, three had pyelitis, one had purpura, and eighteen had albuminuria (of whom six had eclampsia); the rest (178) were in normal health. Polte cannot confirm Bosse's results at all; of these 178 (116 of whom he had examined also in their last month of pregnancy) all presented a perfectly normal fundus; he could find no signs of that neuritis-like swelling of the disc which Bosse described, and which, so suspiciously, had no subjective indications. These remarks do not apply, of course, to the cases in which albumin and tube casts were present in the urine; the matter in hand is the condition of the fundus in the condition of "normal" pregnancy and parturition. It certainly on the face of it seems improbable that definite fundus changes suggesting optic neuritis should be present, as asserted by Bosse, in 75 per cent. of pregnant women; one's own experience is more in accord with the results of Polte's inquiries.—*Klin. Monatsbl. f. Augenh.*, Stuttgart, 1905, December.

Blindness without Ophthalmoscopic Changes.

Loss of vision, complete or incomplete, may occur, of course, from external diseases of the eye, or from what are sometimes called by figure of speech "ophthalmoscopic diseases"; but cases such as that related by Chaillous, in which there was blindness without any eye changes whatever, belong to another category, and have other forms of interest. His case was that of a lad of 16, who consulted Babinski on account of epileptic attacks of several years' duration. Babinski referred him to Chaillous for a report, as he was almost completely blind, and the facts then elicited were sufficiently peculiar to call for publication. Without entering into needless detail, we may recount his symptoms. These were that for some years he had had attacks, increasing in frequency, of epileptic seizures. On each occasion the patient felt giddy, turned pale, lost consciousness, and fell down; but he never micturated nor bit his tongue during the fit, which would last about eight minutes. The only point of apparent importance in his history was that at the age of 2½ years he had had a very sudden and severe illness. One night at that time he was seized with an attack of fever, with delirium and nausea, but no vomiting; a physician who was called in prescribed santonin. On recovering from this seizure the boy was found to be blind, and in this state he ever afterwards remained. The boy was led by his mother, who stated that he was all but blind, and was unable to find his way except in places with which he was quite familiar. He could see the movement of a hand at ½ metre distance, but was unable to count fingers. On account of the incessant unsteadiness of the eyes, it was impossible to be certain, but Chaillous was of opinion that only the central part of the field of vision was intact. The patient walked with his head held well up, and the eyes fully open. Externally and ophthalmoscopically the eyes seemed perfectly normal, and the pupils, medium in size, acted normally, both directly and consensually. The case then resolved itself into either one of cortical or of hysterical blindness. The latter being almost negatived by the early age of onset and by the duration and persistence of the symptoms, the diagnosis of cortical blindness was arrived at. The lesion which could give rise to this condition must have been an extensive thrombosis in the visual area or of softening; Chaillous thought it probable that there had been a local meningitis, leading to interference with the vessels, and so to interruption of the visual path,—probably the most of the visual area converted into an abscess. Two points were a little unusual in this case, even among the rare ones of this condition, namely, that it is very, very seldom indeed that a patient has lived any time after acquiring such a lesion, and that the patient had no knowledge of colours. This latter peculiarity may, however, be fairly enough explained by the early age of onset. What does a child of 2½ years know of colours?—*Rec. d'opht.*, Paris, 1905, December.

OPTIC ATROPHY AND HÆMORRHAGES AT THE MACULA OCCASIONED BY LACTATION.

It is not always easy to distinguish between mere coincidence in such matters as those dealt with by Lobel (Paris) in a recent paper and a true causation. The facts in this particular instance may thus be briefly narrated. A young married woman, æt. 27, complained of somewhat sudden loss of vision. On inquiry, it was found that her mother had died of phthisis, and two sisters of tuberculous meningitis; a brother also was probably a consumptive. She had been married at 21, and her first pregnancy had terminated (from an accident) in a miscarriage. Then came a child, whom she nursed until milk suddenly ceased after ten months. It was at this time that the patient began to notice indistinctness of vision, especially with the right eye,—just two days after the re-establishment of menstruation. As a general rule, the flow was but slight, and lasted three days; but on this occasion the loss of blood was very great, and continued for fifteen days. The patient's behaviour underwent considerable change at the same time; she became peevish, and her memory failed distinctly. When Lobel saw her, the condition had been lasting for a year, and the patient had a large central scotoma, and a pale, sharply defined disc, with narrow arteries. At the macula there were evident traces of old hæmorrhages. Urine was normal, the uterus prolapsed; the patient was morose and forgetful.

Lobel cites a small number of instances, culled from the literature of the subject, in which vision failed apparently as the direct result of lactation, and not merely of over-lactation, including one recorded by Nettleship, in which the patient was attacked by papillitis during lactation of her first child, and this returned during nursing of successive children. In Lobel's own case, the occurrence of intracranial symptoms was unusual, but not unknown.—*Rec. d'opht.*, Paris, 1906, January.

ATROPHY OF THE IRIS ASSOCIATED WITH GENERAL PARALYSIS AND TABES.

In old-standing cases of iritis a form of atrophy of the tissue of the iris is met with, and also, to a less degree, in high myopia and in mere old age; but these varieties are different from that of which Dupuys-Dutemps writes, and which has not, as he asserts, been previously described. This may occur in sectors of the iris; indeed, often does so, but never in concentric zones. The outline of the pupil when this condition is present is often irregular in consequence. A curious point, which he says is true, is also that while the accommodative reaction is irregular and perhaps segmentary, the contraction of the pupil accompanying closure of the palpebral aperture is regular and uniform. He ascribes the state of the iris, varying as it does in degree and precise locality, to the extent, greater or less, to which the ciliary nerves, both long and short, are involved in the general disease.—*Ann. d'ocul.*, Paris, 1905, September.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Obstetrical Society.—*May* 9, 1906.—Dr. J. W. Ballantyne, President, in the chair.—Professor Jardine, Glasgow, read "Notes on Two Cases of Eclampsia: one died from suppression of urine, caused by complete infarction of both kidneys; the other recovered after upwards of 200 fits." The first case was a multipara, who had had eight fits before admission to hospital. She was treated by bleeding and saline infusion, but had three fits afterwards. She was delivered two days later, and had one fit twenty-four hours after the confinement. She passed 35 oz. of urine twelve hours before delivery, but after it suppression of urine supervened. This was treated by cupping, pilocarpin infusions, hot packs, etc., and finally by incision of the capsule of one kidney. The patient, however, died after five and a half days of suppression. The second case was a multipara, who had eight fits before admission. Saline infusion was the treatment adopted, and the patient was well for two and a half days afterwards. The child was then born naturally. Fits began two days after delivery, and continued until 199 had occurred. She was treated by bleeding and transfusion (twice), morphia, chloral, bromide, lumbar puncture, and injection of cocaine. Ultimately, the patient made a good recovery.—Dr. Freeland Barbour read a note of a case of broad ligament cyst, with twisted pedicle and extensive hæmorrhage into the broad ligament, extending into the cellular tissue along the left ovarian vein. He also read a paper on "Abdominal Hysterectomy for Inversion of the Uterus; Fatty Degeneration of the Inverted Portion," and showed the specimen.—Mr. Scott Carmichael read a paper on "Hernia of Uterine Adnexa." He pointed out its relative frequency in inguinal hernia, and discussed the causation from the point of view of the presence of the canal of Nuck, the round ligament, etc. The anatomy of the condition was described in detail, and the pathological changes were considered.

Edinburgh Medico-Chirurgical Society.—*May* 2, 1906. — Professor Greenfield in the chair. — Specimens were shown by Mr. Cotterill. — Mr. Alexis Thomson showed a man, æt. 60, suffering from chronic jaundice and distended gall bladder, with relief of symptoms after cholecystenterostomy.—Mr. Cotterill showed—(1) A man suffering from aneurysmal varix of the orbit; (2) a man after operation for injury to the internal semilunar cartilage of the knee-joint.—Mr. Alexis Thomson and Dr. Woodward gave a demonstration on the treatment of scoliosis by the system of exercises devised by Dr. Klapp.—Mr. L. C. Peel Ritchie showed—(1) A portable rheostat for use with Kirstein's lamp; (2) new ligature winders.—Dr. W. Robertson, M.O.H. for Leith, read a paper on "Infant Milk Depôts in Leith," which appears in this Journal.—Dr. E. Scott Carmichael read a paper on "Inguinal Hernia in the Female," more especially in the child. The paper was based on twenty-three cases he had operated on. The hernia is probably congenital, as in the case of the male, and is more common on the right side. It is usual to find the uterine adnexa in the sac, the cause of this being some abnormal anatomical development. The ovary should not be removed, but should be replaced, even though it shows changes from the normal. Tubercle of the sac occurs in 3 per cent. of the cases, and may be mistaken for the ovary when in the form of a single nodule.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.—*May* 4, 1906.—Dr. J. WALKER DOWNIE showed a preparation from a sarcoma of the temporal dura mater which simulated suppurative mastoiditis.—Dr. ALEXANDER NAPIER gave an account of a case of typhoid fever in which the symptoms were mainly connected with the kidney.—Dr. JOHN BROWNLEE gave an account of six cases of enteric fever in which pyelitis was a complication, and showed (for Dr. E. S. CHAPMAN) micro-photographs of the kidney of one of the cases.—Dr. R. M. BUCHANAN showed specimens from the above cases.—Dr. R. M. BUCHANAN submitted (for Dr. JOSEPH N. GLAISTER) the clinical records of two cases of cerebrospinal meningitis, and showed specimens of the *Diplococcus intracellularis meningitidis* of Weichselbaum from one of them.

May 11, 1906.—Dr. A. A. YOUNG showed—(*a*) Two specimens of sarcoma from the popliteal space. The first was a spindle-celled sarcoma adherent to the tibia, but not growing from and involving the internal popliteal nerve. The patient died three months after operation, from hemiplegia. The second tumour was an encapsuled myxo-sarcoma. (*b*) A patient operated on for acute intestinal obstruction caused by the vermiform appendix. The appendix ended in a bulbous mass which was adherent to intestine. Several coils of intestine had slipped under the appendix and become strangulated.—Dr. T. K. MONRO showed a lung from a case of acute (lobar) pneumonic phthisis. The illness began like an acute pneumonia, but did not end with a crisis. The temperature remained high for seven weeks, and then fell by lysis. The patient died with uræmic symptoms four months from the commencement of the illness.—Dr. R. M. BUCHANAN made a short communication regarding para-typhoid fever.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*May* 14, 1906. —The President, Professor MUIR, in the chair.—Dr. DALZIEL showed the pelvic organs of a child on whom he had operated for extroversion of the bladder by the transplantation of the ureters into the rectum. The operation was performed by opening the peritoneum, and at the same time enlarged abdominal glands were removed. For some time after the operation the case did well, and the urine could be retained for a period of four hours. The child died unexpectedly from intestinal obstruction, resulting from a band of adhesions, probably occasioned by the removal of the lymphatic glands.—Dr. RENTON showed preparations from two cases of malignant disease which necessitated the amputation of the arms and scapulæ.—Drs. G. A. ALLAN and J. S. DUNN gave the clinical history and showed bacteriological preparations from a case of cerebro-spinal meningitis. The patient was 11 years of age, and admitted to the Western Infirmary from Port-Glasgow with acute symptoms of one day's duration, in an unconscious state, and having frequent convulsions. The clinical features of cerebro-spinal meningitis were present, and the meningococcus, with a polymorpho-nuclear leucocytosis, was obtained in the fluid drawn off during life. Vague headaches had been present for about a month, and cough for a week, before admission. No other member of the family was affected, and there were no other cases in the district. The patient died after thirty-four hours' illness, and the diagnosis was confirmed post-mortem, with, in addition, a recent pneumonia.—Dr. Inglis Pollock showed microscopical specimens from a case of sarcoma of the choroid. The chief pathological interest was the extreme necrosis. The onset of the secondary glaucoma had been extremely recent (ten days). He also discussed the various theories of the causation of the necrosis.

ANALYTICAL REPORTS.

Sajodin.

(Bayer Co. Ltd., St. Dunstan's Hill, London, E.C.)

Sajodin is the calcium salt of mono-iodo-behenic acid, and contains 26 per cent. of iodine. It is a tasteless, inodorous white powder, which is insoluble in water. It has been introduced into therapeutics in the hope of its proving an efficient iodine preparation, and yet free from the disadvantage of provoking iodism. Reports from the clinic of Professor Lassar show that the drug is well tolerated by the digestive tract, is readily assimilated, and has the specific effects of an iodide on tertiary syphilitic manifestations. Testimony to its efficacy in asthma, arterio-sclerosis, and tertiary syphilis also comes from the clinic of von Mering in Halle. Sajodin ought to be tried in cases in which potassium iodide is not well borne on account of producing symptoms of iodism.

Standardised Tinctures of Strophanthus and Squills.

(Evans, Gadd, & Co., Exeter.)

When the active principle of a drug is fully known, it can generally be standardised by chemical means. The strength of many important remedies, however, cannot be estimated in this way, and for these a biochemical or physiological method of standardising must be adopted. Messrs. Evans, Gadd, & Co. have sent us samples of their tinctures of strophanthus and squill, standardised at the Pharmacological Laboratory of Cambridge in terms of the minimum lethal dose per frog of given weight. The principle of careful standardisation underlies all accurate dosage, and the manufacturers are to be congratulated on their enterprise in having their tinctures scientifically tested; issued under such a guarantee, they may be prescribed with all confidence.

Hæmostasin. Paragangline.

(Burgoyne, Burbidges, & Co., London.)

Both these drugs are preparations containing the active principle of the suprarenal gland. *Hæmostasin* is a solution of the crystalline active principle in dilute hydrochloric acid, the strength being the convenient one of 1 to 1000, which serves without further dilution for most purposes. The solution is comparatively stable, and retains its activity for a considerable time; it may be diluted with normal saline solution, cocaine, etc., without undergoing decomposition. The name has been selected to emphasise its hæmostatic properties. The specimen sent to us showed all the actions of an efficient preparation of the suprarenal gland.

Paragangline hails from Italy, being manufactured according to Professor Vassale's method in the sero-therapeutic institute of Milan. The special feature of this adrenal extract is that it is made from the medulla of the gland alone, and hence is said to be more efficacious than the adrenalin of commerce. Paragangline appears to be used largely in Italy by mouth administration in the treatment of atonic conditions of the gastro-intestinal tract, and is said to be in no way altered by stomach digestion. The preparation is sent out in convenient drop-bottles of various sizes, and the dose is about the same as that of the preceding—30 to 40 minims in the day.

Xaxa.

(Burroughs, Wellcome, & Co., London.)

Under the trade-mark name "Xaxa," Messrs. Burroughs, Wellcome, & Co. have issued a new salicylic acid derivative—acetyl-salicylic acid. This body possesses all the therapeutic virtues of salicylic acid without its unpleasant after results. It is insoluble in the stomach, and hence does not irritate, but is rapidly dissolved in the intestine. Acetyl-salicylic acid is said to be a more powerful analgesic in non-rheumatic painful conditions than are the other salicylic acid compounds. The dose of xaxa is from 10 to 15 grs., and Messrs. Burroughs, Wellcome, & Co. send it out in the form of tabloids.

Eucaine Lactate.

(Burroughs, Wellcome, & Co., London.)

Eucaine is an artificial alkaloid possessing the local anæsthetic action of cocaine, without the toxic, mydriatic, or vaso-constrictor properties of the latter. It is readily soluble in water, and the solutions may be sterilised by boiling without decomposition occurring. The manufacturers have sent us samples of hypodermic tabloids containing $\frac{1}{3}$ gr., and of soloids containing 1 and 5 grs. Eucaine may be used in 2 per cent. solutions for ophthalmic and dental work, and for rendering mucous membranes in general insenitive, in 4 to 8 per cent. solution for cautery operations on the nose, the removal of tonsils, etc., and as a local anæsthetic in general surgery by hypodermic injection of 4 per cent. solutions. As the drug is practically non-poisonous, stronger solutions may be used if need be.

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